Vol. 1022 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

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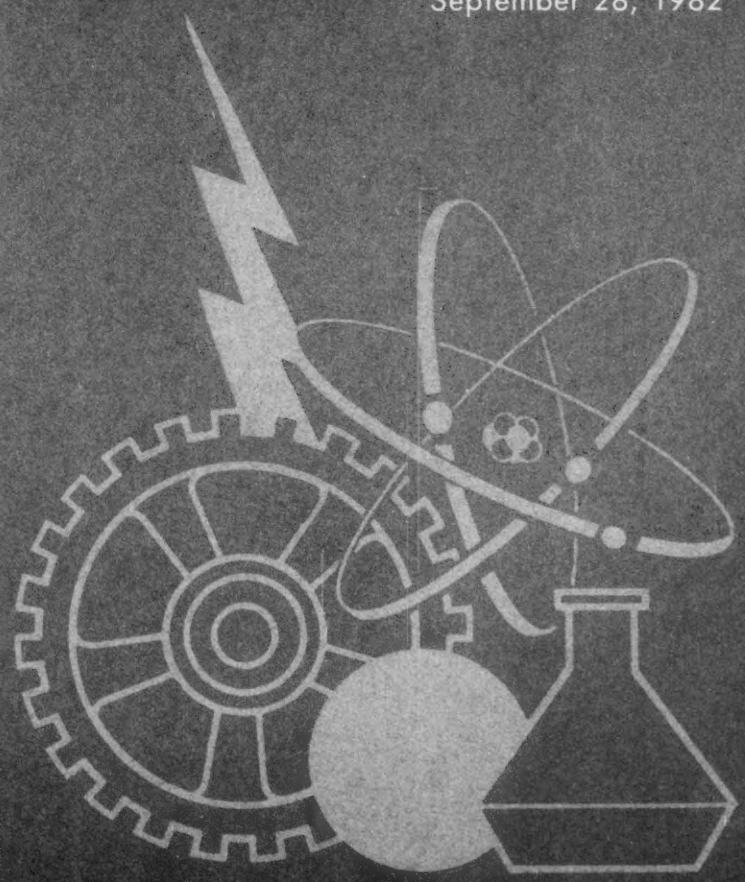

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 28, 1982 Volume 1022 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,645,835, Re. S.N. 398,605, Filed July 15, 1982, Cl. 428/195, MOISTURE-VAPOR-PERMEABLE PRESSURE-SENSITIVE ADHESIVE MATERIALS, Martin E. Hodson, Owner of Record: *T. J. Smith & Nephew Ltd., Yorkshire, England,* Attorney or Agent: Albert L. Jacobs, Jr., Ex. Gp.: 164

3,811,832, Re. S.N. 327,194, Filed Dec. 3, 1981, Cl. 008/94.26, TANNING IMPROVEMENTS, Philip Stanley Briggs, Owner of Record: *Inventor,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 144

4,119,005, Re. S.N. 328,261, Filed Dec. 7, 1981, Cl. 84/1.01, SYSTEM FOR GENERATING TONE SOURCE WAVESHAPES, Michio Kondo, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,256,104 Re. S.N. 397,791, Filed July 16, 1982, Cl. 128/214G, EQUIPMENT SETS AND SYSTEM FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES, Andrew J. Muetterties, et al., Owner of Record: *Abbott Laboratories, North Chicago, Ill.,* Attorney or Agent: Robert L. Niblack, Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 28,576, Reexam. No. 90/000,246, Requested: Aug. 25, 1982, Cl. 523/336, PROCESS FOR RAPID DISSOLVING WATER-SOLUBLE VINYL ADDITION POLYMERS USING WATER-IN-OIL EMULSIONS, Donald R. Anderson, et al., Owner of Record: *Nalco Chemical Co., Chicago, Ill.,* Attorney or Agent: Hume, Clement, Brinks, Willian, Olds & Cook, Ltd., Ex. Gp.: 144, Requester: Lawrence Rosen, New York, N.Y.

4,294,815, Reexam. No. 90/000,247, Requested: Aug. 26, 1982, Cl. 423/478, PROCESS OF PRODUCING CHLORINE DIOXIDE AND, IF DESIRED, CHLORINE, Karl Lohrberg, et al., Owner of Record: *Metallgesellschaft Aktiengesellschaft, Frankfurt Am Main, Germany,* Attorney or Agent: Sprung, Felfe, Horn, Lynch & Kramer, Ex. Gp.: 110, Requester: Erco Industries, Ltd., Islington, Ontario, Canada

COMMISSIONER ORDERED REEXAMINATION

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,332,282, Reexam. No. 90/000,248, ORDERED Aug. 30, 1982, Cl. 141/1, MEANS AND METHOD OF RECLAIMING CRANKCASE OIL, Roger W. Strange, Owner of Record: *Inventor,* Attorney or Agent: Charmasson, Branscomb & Holz, Ex. Gp.: 243

Board of Appeals Decisions Rendered in the Month of Aug. 1982

Affirmed	225
Affirmed in Part	18
Reversed	50
Total	293

Update of PCT Information

Topics covered in this update include:

I. European Patent Office Available As An International Searching Authority on Oct. 1, 1982.
II. Matters To Be Considered When Choosing An International Searching Authority.
III. PCT Fee Amounts.

I. European Patent Office Available as an International Searching Authority on Oct. 1, 1982.

The United States Patent and Trademark Office has informed the International Bureau that in addition to the United States Patent and Trademark Office, the European Patent Office is competent as an International Searching Authority for searching all kinds of international applications filed in the United States Receiving Office on and after Oct. 1, 1982. (PCT Article 16(2) and PCT Rule 35.2(a) (i)).

It should be noted that the European Patent Office will not search, by virtue of PCT Article 17(2) (a) (i), any international application to the extent that it considers that the international application relates to subject matter set forth in PCT Rule 39.1. Furthermore, the European Patent Office is not equipped to search computer programs.

The international search fee for the European Patent Office must be paid to the United States Patent and Trademark Office (USPTO) as a Receiving Office at the

time of filing the international application. The search fee for the European Patent Office is currently set under PCT Rule 16.1(b) at 710 United States dollars ($710.00). The search fee will change as costs and exchange rates require. If exchange rates fluctuate significantly, the fee may change frequently. Notice of changes will be published in the Official Gazette shortly before the effective date of any change.

If the European Patent Office as the International Searching Authority considers that the international application does not comply with the requirement of unity of invention as set forth in PCT Rule 13, the European Patent Office will invite applicants to timely pay *directly to it* an additional search fee of 1,700 Deutsche Mark for each additional invention.

A revised fee calculation sheet (form PCT/RO/101, Annex) having appropriate spaces to indicate the choice of International Searching Authority has been developed so that applicants may indicate which International Searching Authority is to make the search. The revised fee calculation sheet should be available by Oct. 1, 1982. However applicants may indicate the choice of International Searching Authority by placing the name of the desired international searching authority directly after "II SEARCH FEE" on the current fee calculation sheet (form PCT/RO/101, Annex).

II. Matters to be Considered when Choosing an International Searching Authority.

Choosing the European Patent Office (EPO) as an International Searching Authority could be an advantage to United States applicants who designate countries for European Regional patent protection in PCT International applications, for the following reasons:

(1) Claims may be amended according to EPO search results *before* entering the European Office as a designated Office.

(2) The EPO search fee need not be paid upon entering the European Office as a designated office.

(3) The EPO search results may be available for use in the U.S. priority application.

(4) The EPO international search may be obtained without the need for a European Professional Representative.

(5) The European Patent Office search could provide the U.S. applicant with the benefit of a European art search (which may be different from his own or the USPTO'S search) before it is necessary to enter the European Patent Office or other designated Offices and usually before amendments to the U.S. priority application are needed.

(6) Cost factors include the following:

When European countries are designated for European Regional patent protection in an international application, and the USPTO is selected as the International Searching Authority the minimum cost will be $250 for the International Search by the USPTO and about $568 ($710 fee minus a fee reduction of 20% or $142, depending on exchange rates) for the EPO search as a designated Office, making a total of $818. If the EPO is selected as the International Searching Authority, the cost will be $710 for the International Search with no additional fee for the EPO search in the designated Office phase.

In summary if the U.S. applicant enters the EPO as a designated Office after receiving an EPO International Search Report, he may save $108 under USPTO and EPO fees as of Oct. 1, 1982, given rebates and exchange rates, because the applicant will have already paid the EPO international search fee and will not need to pay an additional search fee to the EPO as a designated Office.

If the U.S. applicant selects the EPO as the International Searching Authority but does *not* enter the EPO as a designated Office, the additional cost for having the EPO conduct the PCT international search will be about $460 ($710 for EPO search vs. $250 for USPTO search).

It should be noted that Designated Offices other than the EPO do not appear to make any distinction in their search or examination fees or rebates, whether the PCT International Search report emanates from the USPTO or the EPO.

Some of the disadvantages that may occur due to the European Patent Office making the International Search are the following:

(1) Additional mailing time to and from the EPO Searching Authority may shorten the time for applicants to respond to various invitations from the EPO such as for comments on abstracts and payments of additional search fees as well as for PCT Article 19 amendments to the claims after issuance of the International Search Report.

(2) There may be more difficulty in solving any procedural problems between the applicant and the EPO than with the USPTO due to physical distance and time differences.

III. PCT Fee Amounts.

A. The fees which have been established by the Patent and Trademark Office and announced in the Federal Register on July 30, 1982 at 33066-33112 include fees established under the authority of 35 U.S.C. 376 for international applications filed on and after Oct 1, 1982 as follows:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) - $125.00.

(2) A search fee where the USPTO is chosen as International Searching Authority (see 35 U.S.C. 361(d) and PCT Rule 16) and where:

(i) No corresponding prior United States national application with fee has been filed $500.00

(ii) Corresponding prior United States national application with fee has been filed $250.00

(3) A supplemental search fee when required by the USPTO as an International Searching Authority (see PCT Art. 17(3) (a) and PCT Rule 40.2) - $125.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 37 CFR 1.16(a) through (d) credited by an amount of $250 where an international search fee has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under 37 CFR 1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single international search fee.

The following fee remains unchanged:

(5) A special fee when required (see 35 U.S.C. 372(c)), per claim $10.00

(The fee for preparing a certified copy of the priority document is set forth in 37 CFR 1.19(a) (3) and (b) (1).)

B. The basic fee and designation fee portions of the international fee are prescribed in PCT Rule 15. The amounts of these fees are:

Basic Fee (first 30 pages)	$270.00
Basic Supplemental Fee (for each sheet over 30)	$ 6.00
Designation Fee (per national or regional office)	$ 65.00

GERALD J. MOSSINGHOFF,
Sept. 3, 1982. *Commissioner of Patents and Trademarks.*

Standardized Disclaimers

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition

and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use ——, apart from the mark as shown.

MARGARET M. LAURENCE,
Aug. 30, 1982. *Assistant Commissioner for Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Oct. 15, 1982.

DONALD J. QUIGG,
Aug. 30, 1982. *Chairman, Committee on Enrollment.*

Brandes, Karlheinz K., 1901 College View Dr., Bartlesville, Okla. 74003
Breitenstein, George T., 32 S. Shore Dr., New Port Richey, Fla. 33552
Clements, Gregory N., 8010 Orange Plank, Springfield, Va. 20513
Dubno, Herbert, c/o Karl F. Ross, 5676 Riverdale Ave., Riverdale, N.Y. 10471
Indyk, Eugene S., RFD #1, Box 474A, Jamesburg, N.J. 08831
Hamrock, William F., 1337 Julia Ave., McLean, Va. 22101
Kendall, Ralph S. C., 2505 Lakevale Dr., Vienna, Va. 22180
Kierans, Patrick E., 606 Cathcart St., Suite 440, Montreal, Quebec, Canada H3B 1K9
Konkol, Chris P., 6910 Allview Dr., Columbia, Md. 21046
Lang, Ernest U., 1510 Platt St., Niles, Mich. 49120
Loughnane, Michael D., 54 Grey Ave., Allendale, N.J. 07401
Meyer, William E., 35 Maple St., Stoneham, Mass. 02180
Spiegel, H. Jay, Sherman & Shalloway, 413 N. Washington St., Alexandria, Va. 22314
Tayon, Jeff, 23 Orchard Dr., Belle Ville, Ill. 62221

Patent Suits

Notices under 35 U.S.C 290; Patent Act of 1952

2,991,225, August Franciscus Harms, O-METHYL-BENZHYDRYL-B-DIMETHYLAMINOETHYL ETHER PROCESS AND COMPOSITION FOR SYMPTOMATIC RELIEF OF THE SYNDROME OF PARKINSONISM AND OF SPASTIC SKELETAL MUSCLE DISORDERS, **filed** Mar. 28, 1978, D.C. District of Columbia (Wash. D.C.), Doc. 78-0553, *Riker Laboratories, Inc.* v. *Gist-Brocades N.V.* Stipulation dismissing complaint and counterclaim with prejudice filed May 17, 1982.

3,173,694, Hamilton Kent Mfg. Co., Inc., GASKET, **filed** July 13, 1979, D.C., N.D. Ind. (Fort Wayne), Doc. F 79-134, *Hamilton Kent Mfg. Co., Inc.* v. *Pipe Gasket & Supply Co., Inc.* Case dismissed with prejudice on June 1, 1982.

3,228,202, Richard T. Cornelius, METHOD AND MEANS FOR MAKING CRACKED ICE AND THE LIKE, **filed** July 9, 1982, D.C. Minn. (St. Paul), Doc. 3-82-879, *Paul Keller* v. *McQuay-Perfex, Inc.* **Same, filed** July 12, 1982, D.C. Minn. (St. Paul), Doc. 3-82-881, *McQuay-Perfex, Inc.* v. *Paul Keller.*

3,230,798, Kubicek and Toth, DEBURRING TOOLS; **3,276,294,** Louis A. Kubicek, **same; 3,661,473,** Burr-Ban Tool Service Co., EXTENSION TOOL HOLDER; **3,761,104,** Burr-Ban Tool Service Co., EXTENSION TOOL HOLDER; **3,970,406,** Louis A. Kubicek, TOOL HOLDER WITH MISALIGNMENT COMPENSATING MEANS; **3,975,111,** Louis A. Kubicek, COMBINATION EXTENSION AND COMPRESSION TOOL HOLDER, **filed** June 14, 1982, D.C., E.D. Mich. (Ann Arbor), Doc. 82-60201, *Louis A. Kubicek & Burr-Ban Tool Service Co.* v. *Cogsdill Enterprises, Inc.*

3,273,171, Joe H. Lamb, CARRIER FOR FORWARD EDGE OF EXTENDIBLE AND RETRACTABLE FLEXIBLE SHEET, **filed** June 10, 1982, D.C., N.D. Calif. (San Francisco), Doc. C 82-2969RPA, *Automated Solar Covers, Inc., et al* v. *Aquamatic Pool Covers, Inc., et al.*

3,276,294. (See 3,230,798.)

3,282,483, Kenneth L. Babcock, BACK PACK, **filed** July 8, 1982, D.C., S.D. Calif. (San Diego), Doc. 82-0794-E(H), *Kenneth L. Babcock* v. *The Coleman Co., Inc., et al.*

3,355,825, Root Spring Scraper Co., BLADE POSITION LOCK AND RELEASE SYSTEM FOR ROAD SCRAPERS, **filed** Nov. 30, 1981, D.C., W.D. Mich. (Kalamazoo), Doc. K81-420CA8, *Root Spring Scraper Co.* v. *Inland Lake Machine, Inc.* Complaint and Counterclaim dismissed with prejudice and without costs to either party on July 13, 1982.

3,378,633, Albert Macovski, MONOCHROME PHOTOGRAPHY SYSTEM FOR COLOR TELEVISION; **Re. 27,491, same,** PHOTOGRAPHY USING SPATIAL FILTERING, **filed** July 19, 1982, D.C., N.D. Calif. (San Francisco), Doc. C82-3625 WWS, *S R I International* v. *Matsushita Corp. of America.*

3,386,955, American Cyanamid Co., SUBSTITUTED UREAS AS LOW TEMPERATURE EPOXY CURING AGENTS, **filed** Jan. 19, 1978, D.C. Del. (Wilmington), Doc. 78-22, *American Cyanamid Co.* v. *Minnesota Mining & Mfg. Co.* Dismissal of claims and counterclaims with prejudice filed June 3, 1982.

3,416,637, Societe Anonyme Francaise Du Ferodo, RADIALLY MOVABLE CLUTCH BEARING, **filed** July 28, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4923 RJW, *Valeo, formerly Societe Anonyme Francaise Du Ferodo* v. *Mitsubishi International Corp.*

3,416,984, Sealed Air Corp., METHOD AND APPARATUS FOR MAKING CELLULAR MATERIAL FROM THERMOPLASTIC SHEETS, **filed** Feb. 11, 1980, D.C., S.D.N.Y., Doc. 80-Civ-828 TPG, *Sealed Air Corp.* v. *Bubble Protek, Inc.* Plaintiff is owner of Pat. No. 3,416,984 which is good and valid in law. Defendant is hereby enjoined and restrained from further infringing Plaintiff's patent. Filed July 2, 1982.

3,464,129, Thomas M. Bogenschuts, BLADE AND MOLDBOARD SUPPORTING AND ADJUSTING STRUCTURE FOR SNOWPLOWS; **3,604,131,** Bogenschutz and Farrell, MOLDBOARD SUPPORTING STRUCTURE, **filed** July 14, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80-2748, *Compro-Frink Corp.* v. *Valk Mfg. Co.* Pat. Nos. 3,464,129 and 3,604,131 are valid and enforceable. Order filed June 16, 1982.

3,485,797, Ashland Oil, Inc., PHENOLIC RESINS CONTAINING BENZYLIC ETHER LINKAGES AND UNSUBSTITUTED PARA POSITIONS, **filed** June 16, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-72222, *Ashland Oil, Inc.* v. *Thomas C. Glenn.*

3,501,045, Asmus and Jecker, SEALED CONTAINER ASSEMBLY, **filed** July 27, 1982, D.C., N.D. Ohio (Cleveland), Doc. C82-1917, *Richard W. Asmus and Andrew E. Jecker* v. *Rini Supermarkets, Inc., et al.*

3,556,776, Armco Steel Corp., STAINLESS STEEL, **filed** June 22, 1982, D.C., W.D. Pa. (Pittsburgh), Doc. 82-1126, *Armco, Inc.* v. *Cyclops Corp.*

3,604,131. (See 3,464,129.)

3,605,054, Detroit Coil Co., ENCAPSULATED ALTERNATING CURRENT SOLENOID, **filed** July 19, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4465, *Detroit Coil Co.* v. *Guardian Electric Mfg. Co.*

3,644,023, Luciano Villani, SPRING LOADED SPECTACLE HINGE; **3,957,360, same,** SPECTACLE FRAMES WITH SPRING-LOADED HINGES, **filed** May 5, 1982, D.C., S.D.N.Y., Doc. 82-Civ-2883 (EW), *LN Industries, S.A.* v. *La Meccanoptica Leonardo S.p.A., et al.* **Same, filed** July 6, 1982, D.C.N.J. (Newark), Doc. 82-2178, *La Meccanoptica Leonardo S.p.A.* v. *Safilo S.p.A.*

3,647,983, San/Bar Electronics Corp., KEY SYSTEM LINE CARD CIRCUIT, **filed** July 2, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV-82 3300, *San/Bar Corp.* v. *Quality Communication Products, Ltd., et al.*

3,661,473. (See 3,230,798.)

3,666,311, Hastings Fiber Glass Products, Inc., SHOTGUN STICK, **filed** July 26, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4630, *Hastings Fiber Glass Products, Inc.* v. *A. B. Chance Co.*

3,744,557, Argus Engineering Co., Inc. APPARATUS FOR FUSING AND SEALING PLATINGS AND THE LIKE, **filed** June 26, 1981, D.C., W.D. Va. (Lynchburg), Doc. 81-0101-L, *Argus International* v. *International Circuit Technology, Inc.* **Same, filed** June 24, 1982, D.C. Minn. (Minneapolis), Doc. 4-82-Civil 887, *BGK Circuit Industry Systems, Inc.* v. *Argus International.*

3,761,104. (See 3,230,798.)

3,766,851, Sun Chemical Corp., CONTINUOUS CAN PRINTER AND HANDLING APPARATUS, **filed** Mar. 18, 1981, D.C., N.D. Ohio (Toledo), Doc. C81-146, *Sun Chemical Corp.* v. *Stroh Container, Inc.* Notice of dismissal filed Apr. 6, 1981.

3,791,043, Michael King Russell, INDICATING INSTRUMENTS, **filed,** July 14, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3452 IH, *AMF Scientific Drilling International* v. *Drilling Measurements, Inc., et al.*

3,806,852, The Stanley Works, SWITCH ACTIVATING HINGE, **filed** Dec. 4, 1979, D.C. Del. (Wilmington), Doc. 79-566, *The Stanley Works* v. *Rixson-Firemark, Inc.* Stipulation and Order dismissing action with prejudice filed July 12, 1982.

3,897,333, Allied Colloids Mfg. Co., Ltd., FLOCCULATING AGENTS, **filed** July 26, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-2064, *Nalco Chemical Co.* v. *Allied Colloids, Ltd.*

3,953,062, John F. Maston, PADLOCK CLASP, **filed** Sept. 30, 1980, D.C, S.D. Calif. (San Diego), Doc. 80-1641G(M), *John F. Maston* v. *Holmes-Hally Industries, et al.* Pat. No. 3,953,062 which issued to plaintiff is valid. Judgment determined that defendant infringed plaintiff's patent. Filed July 20, 1982.

3,957,360. (See 3,644,023.)

3,970,406. (See 3,230,798.)

3,973,282, Marvin I. May, WATER BED LINER HOLDER, **filed** July 2, 1981, D.C., N.D. Tex. (Dallas), Doc. CA3-81-1083-D, *Marvin I. May* v. *Vinylex Corp.* Ordered that Vinylex's motion for summary judgment be denied and May's motion to dismiss be granted and this action hereby dismissed without prejudice. Filed June 23, 1982.

3,975,111. (See 3,230,798.)

4,106,628, Warkentin and Mills, SORTER FOR FRUIT AND THE LIKE, **filed** June 18, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3065, *Sunkist Growers, Inc.* v. *Pennwalt Corp.*

4,126,546, Rederiaktiebolaget Nordstjernan, METHOD FOR THE FILTRATION OF A SUSPENSION OR EMULSION; **4,197,201, same,** APPARATUS FOR THE FILTRATION OF A SUSPENSION OR EMULSION, **filed** July 6, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-1877, *DMP Corp.* v. *Rederiaktiebolaget Nordstjernan.*

4,128,602, General Electric Co., POLYPHENYLENE ETHER COMPOSITIONS CONTAINING RUBBER MODIFIED POLYSTYRENE, **filed** July 22, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4796 CLB, *General Electric Co.* v. *Asahi-Dow Ltd., et al.*

4,138,186, Everett/Charles, Inc., TEST APPARATUS, **filed** May 8, 1981, D.C., W.D. Va. (Harrisonburg), Doc. 81-0066 (H), *Everett/Charles, Inc., et al* v. *World Enterprises, Inc.* **Same, filed** Apr. 29, 1981, D.C., N.D. Calif. (San Francisco), Doc. C81-1696 SAW, *Everett/Charles, Inc.* v. *M-Rel, Inc.* Order on stipulation that action be dismissed with prejudice filed June 30, 1982.

4,176,921, Jan H. Matthias, EYEGLASSES HAVING REMOVABLE LENSES, **filed** July 23, 1982, D.C.N.J. (Camden), Doc. 82-2347, *Carrera International Corp.* v. *Mediq, Inc., doing business as Swank Optical Co.*

4,179,081, John C. Parry, APPARATUS FOR APPLICATION OF PLASTICS STRETCH FILMS; **4,248,392, same, filed** July 6, 1982, D.C.N.J. (Newark), Doc. 82-2176, *John C. Parry, doing business as J. C. Parry & Sons Co., Inc.* v. *Time SavRs Associates, et al.*

4,191,807, Teledyne Industries, Inc., AIRCRAFT BATTERY, **filed,** Feb. 4, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-525-RMT, *Teledyne Industries, Inc.* v. *Concorde Battery Corp.*

4,197,201. (See 4,126,546.)

4,197,675, Edward Kelly, SENSING SYSTEM FOR AUTOMATICALLY OPENING GARAGE DOORS, **filed** June 29, 1982, D.C.N.J. (Newark), Doc. 82-2100, *Edward Kelly* v. *Stanley Works.*

4,204,225, Wisconsin Alumni Research Foundation, REAL-TIME DIGITAL X-RAY SUBTRACTION IMAGING; **4,204,226, same,** REAL-TIME DIGITAL X-RAY TIME INTERVAL DIFFERENCE IMAGING, **filed** July 1, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4100, *Wisconsin Alumni Research Foundation* v. *Adac Laboratories.*

4,204,226. (See 4,204,225.)

4,211,893, Mesa Engineering, Inc., DUAL MODE MUSIC INSTRUMENT AMPLIFIER, **filed** Dec. 22, 1981, D.C., S.D. Calif. (San Diego), Doc. 81-1307-E (H), *Mesa Engineering, Inc.* v. *Carvin Corp.* **Same, filed** July 2, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV82-3287-DWW (Tx), *Randall C. Smith* v. *Acoustic Control Corp.*

4,222,803, Armstrong Cork Co., METHOD OF MAKING FABRIC COVERED CEILING BOARD, **filed** July 28, 1982, D.C. Minn. (Minneapolis), Doc. 4-82 Civil 1063, *Conwed Corp.* v. *Armstrong World Industries, Inc.*

4,234,134, Helena Laboratories Corp., PAPER TENSIONING DEVICE, **filed** Jan. 8, 1982, D.C.N.J. (Camden), Doc. 82-47 *Medical Research & Product Development Corp.* v. *Helena Laboratories Corp.* **Same, filed** Nov. 4, 1981, D.C.N.J. (Camden), Doc. 81-3436, *Helena Laboratories Corp.* v. *United Medical Corp.* Action dismissed without prejudice on July 26, 1982.

4,235,070, Dynamex Corp., WIRE STRANDING MACHINE AND CONTROL MEANS THEREFOR, **filed** June 9, 1982, D.C., S.D.N.Y., Doc. 82-Civ-3784 EW, *Dynamex Corp.* v. *Watson Machine Co., et al.*

4,248,392. (See 4,179,081.)

4,272,466, Harrel, Inc., SYSTEM AND METHOD OF TEMPERATURE CONTROL FOR PLASTICS EXTRUDER, **filed** July 30, 1982, D.C. Del. (Wilmington), Doc. 82-501, *Eurotherm Corp.* v. *Harrel, Inc.*

4,287,993, Vito Licari, ADJUSTABLE RACK FOR HANGING ARTICLES, **filed** May 3, 1982, D.C., S.D.N.Y., Doc. 82-Civ-2808 TPG, *K-Del Industries, Inc.* v. *Basic Line, Inc., et al.* **Same, filed** June 28, 1982, D.C.N.J. (Newark), Doc. 82-2050, *K-Del Industries, Inc.* v. *Basic Line, Inc.*

Re. 27,491. (See 3,378,633.)

D. 233,135, Plough, Inc., SHIPPING CARTON FOR CONTAINER OR THE LIKE, **filed** Apr. 28, 1981, U.S. Court of Appeals (Sixth Circuit, Cincinnati), Doc. 81-5282, *Irvin W. Combs* v. *Plough, Inc., et al.* Ordered and adjudged that judgment of U.S. District Court for the Western District of Tennessee is affirmed. Filed June 23, 1982.

PP 3,283, M. C. van Staaveren, ALSTROEMERIA PLANT (CANARIA); **PP 3,284, same,** HYBRID ALSTROEMERIA PLANT; **PP 4,634, same,** ALSTROEMERIA PLANT NAMED KING CARDINAL; **PP 4,635, same,** ALSTROEMERIA NAMED RED SUNSET, filed June 25, 1982, D.C., S.D. Calif. (San Diego), Doc. 82-0751-K-H, *B. V. Handelskwekerij and M.C. van Staaveren* v. *Kiernan-Diggins, Ltd., et al.*

PP 3,284. (See PP 3,283.)

PP 4,634. (See PP 3,283.)

PP 4,635. (See PP 3,283.)

Status of PTO Services

The following is an update of the status of PTO services as of Sept. 2, 1982:

Service Item	FY 1982 Performance Goal (Calendar Days)	Actual	Comment
Internal Mail Processing & Delivery	4	4.5	
Filing Receipts:			
Patents	22	46	Reduction from 100 days in February.
Trademarks	30	35	
Patent Copies:			
Window Coupons	5	93% within 5 days 99% within 10 days	
Mail Coupons*	29	99% within 24 days	
Letter Orders*	34	95% within 34 days	
Certified Copies:			
Trademark Regs.	30	20	
Applications-As-Filed*	20	94% within 15 days	
File-Wrapper/Contents*		37% within 15 days 79% within 30 days	
Walk-up Certification	1	99% within 1 day	Service now includes applications-as-filed.
Trademark Search Room:			
Filing Drawings	21	48	
Filing Reg. Certificates	3	22	
Patent Assignments	15	94	Expect reduction in FY 1983.
Trademark Assignments	21	97	Expect reduction in FY 1983.
Patent Official Gazette	Issue Date	On Schedule	
Patent Grants	Issue Date	On Schedule	
Trademark Official Gazette	Issue Date	On Schedule	
Trademark Registrations	Issue Date	2 days late	

*Goal now includes mail processing and delivery time. A recent survey of mail delivery times for these services yielded the fact that the *average* amount of time required for one-way delivery is seven calendar days. Therefore the prior goal was increased by 14 days to reflect average time from mailing by requestors to receipt of copies.

Sept. 2, 1982.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 28, 1982

D. 254,583	4,306,250	4,329,091	4,339,037
D. 261,680	4,309,063	4,329,312	4,339,253
4,146,549	4,309,517	4,329,326	4,339,305
4,148,794	4,310,548	4,330,322	4,339,308
4,177,073	4,310,596	4,330,547	4,339,725
4,202,092	4,312,591	4,331,190	4,339,775
4,205,161	4,313,031	4,332,180	4,339,915
4,208,677	4,313,152	4,332,279	4,339,926
4,224,973	4,313,877	4,332,793	4,340,063
4,229,965	4,313,882	4,332,916	4,340,356
4,230,665	4,314,292	4,332,938	4,340,616
4,246,641	4,315,295	4,333,135	4,340,915
4,251,458	4,317,763	4,333,186	4,341,215
4,253,019	4,318,659	4,333,433	4,341,710
4,270,098	4,319,279	4,333,828	4,341,983
4,272,501	4,320,153	4,333,917	4,342,150
4,272,995	4,322,131	4,333,950	4,342,173
4,275,375	4,322,286	4,334,019	4,342,300
4,276,896	4,323,971	4,335,485	4,342,495
4,282,183	4,325,261	4,335,645	4,342,522
4,287,652	4,325,765	4,336,016	4,342,812
4,288,580	4,325,928	4,336,123	4,342,985
4,292,666	4,326,136	4,336,218	4,343,043
4,296,275	4,327,409	4,336,267	4,343,364
4,300,460	4,327,798	4,336,303	4,343,596
4,301,044	4,328,123	4,336,598	4,343,881
4,303,832	4,328,360	4,337,100	4,344,176
4,304,705	4,328,690	4,338,529	4,344,905
4,306,122	4,328,896	4,338,723	4,345,054

Disclaimers

3,563,399.—*Charles C. Shivers,* Corydon, Iowa. METHOD FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN. Patent dated Feb. 16, 1971. Disclaimer filed June 15, 1981, by the inventor.

Hereby enters this disclaimer to claim 3 of said patent.

4,144,730.—*Edward E. Judge, Jr.,* Lansing, Mich. PRODUCTION WORKPIECE STRAIGHTENING SYSTEM. Patent dated Mar. 20, 1979. Disclaimer filed Oct. 17, 1979, by the assignee, *Industrial Metal Products Corp.*

Hereby enters this disclaimer to claims 13, 17 and 18 of said patent.

4,192,733.—*Takashi Onodera; Kikuji Komine; Fumio Ohashi;* and *Tsutomu Naito,* Saitama-Ken, Japan. SOLVENT DEWAXING WAXY HYDROCARBON OILS USING DEWAXING AID. Patent dated Mar. 11, 1980. Disclaimer filed Oct. 15, 1981, by the assignee, *Toa Nenryo Kogyo Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1 to 16 of said patent.

Dedications

3,516,718.—*Erskine P. Garrison,* Long Beach and *John E. Tschirky,* Manhattan Beach, Calif. LOWER THRUST EQUALIZER FOR DRILLING TOOLS. Patent dated June 23, 1970. Dedication filed Aug. 25, 1980, by the assignee, *Smith International, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,801,466.—*Jerry W. Denney,* Carmel, Ind. URIC ACID ASSAY AND REAGENTS THEREFOR. Patent dated Apr. 2, 1974. Dedication filed Feb. 25, 1982, by the assignee, *American Monitor Corp.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimer and Dedication

3,484,237.—*Meredith D. Shattuck* and *Ulo Vahtra,* San Jose, Calif. ORGANIC PHOTOCONDUCTIVE COMPOSITIONS AND THEIR USE IN ELECTROPHOTOGRAPHIC PROCESSES. Patent dated Dec. 16, 1969. Disclaimer and Dedication filed Mar. 17, 1981, by the assignee, *International Business Machines Corp.*

Hereby disclaims and dedicates to the Public claims 1–8 of said patent.

OFFICIAL GAZETTE NOTICE

REVISION OF PATENT AND TRADEMARK FEES

The purpose of this notice is to remind the public of changes in patent and trademark fees, effective October 1, 1982, pursuant to Public Law 97-247, enacted August 27, 1982. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982, at 47 FR 33086-33112 with corrections in the printing thereof being published on August 4, 1982, at 47 FR 33688 and on August 5, 1982, at 47 FR 33959. The final rule was also published in the Patent and Trademark Office Official Gazette on August 10, 1982, at 1021 O.G. 19-94. In view of the enactment of Public Law 97-247, the "Alternative A - Rule Changes Under Only Public Law 96-517" relating to both patents and trademarks will not become effective. Instead, the "Rule Changes Common To Public Law 96-517 and H.R. 6260" and "Alternative B - Rule Changes Under H.R. 6260" will become effective for both patents and trademarks on October 1, 1982. H.R. 6260 is now Public Law 97-247.

The Patent and Trademark Office has received a number of questions regarding the implementation of the changes in fees. The final rule published in the Federal Register on July 30, 1982, and in the Official Gazette on August 10, 1982, contains implementing instructions which should be carefully read and followed. The final rule includes in the implementing instructions the following:

> "Any fee which is due and payable on or after October 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office."

A "Certificate of Mailing under §1.8" is not "proper" for items which are specifically excluded from the provisions of §1.8. Section 1.8 of Title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is not "proper." Such items include, inter alia, the filing of national and international applications for patent and the filing of trademark applications. Any application for patent or trademark filed, i.e., received in the Office, on or after October 1, 1982, must include the fees which are effective on October 1, 1982, since §1.8 does not apply to, and specifically excludes from its provisions, the filing of applications for patents and trademarks.

Date 9/14/82

Gerald J. Mossinghoff
Commissioner of Patents
and Trademarks

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2

[Docket No. 2714-129]

Revision of Patent and Trademark Fees Confirmation

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Confirmation of rules.

SUMMARY: This document confirms certain rule changes for patent and trademark fees and fee-related procedures which take effect on October 1, 1982. These rule changes implement H.R. 6260 which was enacted as Public Law 97-247 on August 27, 1982.

EFFECTIVE DATE: October 1, 1982.

FOR FURTHER INFORMATION CONTACT:

As to the patent rules contact: R. Franklin Burnett, by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3-11A13, Washington, D.C. 20231.

As to the trademark rules contact: Miss Maude Williams, by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Room 3-11C17, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The Patent and Trademark Office is required by law to publish a notice in the Federal Register of its fees at least 60 days before the effective date thereof (35 U.S.C. 41(g)). Thus, on July 30, 1982 a final rule document was published at 47 FR 33086 setting forth rule changes for patent and trademark fees and procedures which take effect on October 1, 1982. The document was based on the public law in effect at that time, Public Law 96-517, and on H.R. 6260, which was then pending but is now Public Law 97-247. The final rule document published on July 30, 1982, in the Federal Register sets out--

(1) rules that are common to both Pub. L. 96-517 and H.R. 6260 (now Pub. L. 97-247);

(2) Alternative A which contains rule changes implementing Pub. L. 96-517 alone; and

(3) Alternative B which contains rule changes implementing H.R. 6260 (now Pub. L. 97-247).

H.R. 6260 was enacted as Public Law 97-247 on August 27, 1982, and the Patent and Trademark Office hereby confirms that the rule changes common to both Pub. L. 96-517 and H.R. 6260 and Alternative B are those which go into effect on October 1, 1982.

The rules under Alternative A are hereby withdrawn. Additional rule changes required by Public Law 97-247 will be made the subject of separate rulemakings.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

Amendment of Regulations

For the reasons set out in the preamble, 37 CFR Parts 1 and 2 are confirmed as being amended by the final rule published on July 30, 1982 at 47 FR 33086 as set forth below.

September 14, 1982
Date

Gerald J. Mossinghoff
Commissioner of Patents and Trademarks

1. The rule changes made in Alternative A relating to patents which begin at 47 FR 33107 and in Alternative A relating to trademarks which begin at 47 FR 33112 are hereby withdrawn.

2. Confirmed as effective October 1, 1982 are the rule changes published July 30, 1982 common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) and Alternatives B. The rule changes relating to patents common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33099. The rule changes relating to patents under Alternative B were published at 47 FR 33108. The rule changes relating to trademarks common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33111. The rule changes relating to trademarks under Alternative B were published at 47 FR 33112. Corrections to the July 30, 1982 publication were published on August 4 and 5, 1982 at 47 FR 33688 and 33959.

3. For the convenience of the user, the rule changes common to Public Law 96-517 and H.R. 6260 and Alternative B have been integrated into numerical order and are reprinted below:

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and under Sections 31 and 41 of the Trademark Act of July 5, 1946, 15 U.S.C. 1113, and 1123, Parts 1 and 2 of Title 37, Code of Federal Regulations, have been amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. Section 1.11 is amended by revising paragraph (c) to read as follows:

§1.11 Files open to the public.

* * * * *

(c) All requests for reexamination for which the fee under §1.20(c) has been paid, will be announced in the Official Gazette. Any reexaminations at the initiative of the Commissioner pursuant to §1.520 will also be announced in the Official Gazette. The announcement shall include at least the date of the request, if any, the reexamination request control number or the Commissioner initiated order control number, patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

* * * * *

2. Section 1.12 is revised to read as follows:

§1.12 Assignment records open to public inspection.

(a) The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon request and payment of the fee set forth in §1.19(a)(5).

(b) Assignment records, digests, and indexes, relating to any pending or abandoned patent application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or applicant's assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee, or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules.

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in secrecy under §1.14, or any information with respect thereto, must (1) be in the form of a petition accompanied by the petition fee set forth in §1.17(i) or (2) include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

(d) An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number or international application number of the application, an

extra charge as set forth in §1.21(f) will be made for the time consumed in making a search for such assignment.

3. Section 1.14 is amended by adding a new paragraph (e) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or of any papers relating thereto, must (1) be in the form of a petition and be accompanied by the petition fee set forth in §1.17(i) or (2) include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

4. A new §1.16 is added which reads as follows:

§1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§1.9(f))	$150.00
By other than a small entity	$300.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f))	$ 15.00
By other than a small entity	$ 30.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§1.9(f))	$ 5.00
By other than a small entity	$ 10.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(f) For filing each design application:

By a small entity (§1.9(f))---------- $ 62.50
By other than a small entity---------- $125.00

(g) Basic fee for filing each plant application:

By a small entity (§1.9(f))---------- $100.00
By other than a small entity---------- $200.00

(h) Basic fee for filing each reissue application:

By a small entity (§1.9(f))---------- $150.00
By other than a small entity---------- $300.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§1.9(f))---------- $ 15.00
By other than a small entity---------- $ 30.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent, (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes.):

By a small entity (§1.9(f))---------- $ 5.00
By other than a small entity---------- $ 10.00

(Note, see §1.445 for international application filing and processing fees.).

5. A new §1.17 is added which reads as follows:

§1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $ 25.00
By other than a small entity---------- $ 50.00

(b) Extension fee for response within second month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $ 75.00
By other than a small entity---------- $150.00

(c) Extension fee for response within third month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $175.00
By other than a small entity---------- $350.00

(d) Extension fee for response within fourth month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $275.00
By other than a small entity---------- $550.00

(e) For filing a notice of appeal from the examiner to the Board of Appeals:

By a small entity (§1.9(f))---------- $ 57.50
By other than a small entity---------- $115.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§1.9(f))---------- $ 57.50
By other than a small entity---------- $115.00

(g) For filing a request for an oral hearing before the Board of Appeals:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$120.00

--§1.45 - for correction of inventorship
--§1.47 - for filing by other than all the inventors or a person not the inventor

--§1.182 - for decision on questions not specifically provided for
--§1.183 - to suspend the rules
--§1.268 - for late filing of interference settlement agreement

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$ 60.00

--§1.12 - for access to an assignment record
--§1.14 - for access to an application
--§1.55 - for entry of late priority papers
--§1.102 - to make application special
--§1.103 - to suspend action in application
--§1.177 - for divisional reissues to issue separately
--§1.268 - for access to interference settlement agreement
--§1.312 - for amendment after payment of issue fee
--§1.313 - to withdraw an application from issue
--§1.314 - to defer issuance of a patent
--§1.334 - for patent to issue to assignee, assignment recorded late

(j) For filing a petition to institute a public use proceeding under §1.292----------$750.00

(k) For processing an application filed with a specification in a non-English language (§1.52(d))----------$ 20.00

(l) For filing a petition (1) for the revival of an abandoned application under 35 U.S.C. 133, or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity (§1.9(f))----------$ 25.00
By other than a small entity----------$ 50.00

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§1.9(f))----------$250.00
By other than a small entity----------$500.00.

6. A new §1.18 is added which reads as follows:

§1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§1.9(f))---------- $250.00

By other than a small entity---------- $500.00

(b) Issue fee for issuing a design patent:

By a small entity (§1.9(f))---------- $ 87.50
By other than a small entity---------- $175.00

(c) Issue fee for issuing a plant patent:

By a small entity (§1.9(f))---------- $125.00
By other than a small entity---------- $250.00.

7. A new §1.19 is added which reads as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, or defensive publication document, except color plant patent---------- $ 1.00

(2) Printed copy of a plant patent in color---------- $ 8.00

(3) Copy of patent application as filed, each 50 pages or fraction thereof---------- $18.00

(4) Copy of patent file wrapper and contents, each 100 pages or fraction thereof---------- $30.00

(5) Copy of Office records, except as provided in paragraphs (a)(1) through (4) of this section, per page---------- $ 0.30

(6) Microfiche copy of microfiche, per microfiche---------- $ 2.00

(b) Certified copies of Office documents:

(1) For certifying Office records, per certificate---------- $ 3.50

(2) For a search of assignment records, abstract of title and certification, per patent---------- $12.00

(3) For comparing copies not prepared by the Office with the original, prior to certification of the copies, per page---------- $ 0.10

(c) Subscription services:

(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and one subclass---------- $ 4.00

(2) For annual subscription to each additional subclass in addition to the one covered by the fee under paragraph (c)(1) of this section, per subclass---------- $ 0.40

(d) Library service (35 U.S.C. 13):

For providing to libraries copies of all patents issued annually, per annum---------- $ 50.00

(e) Lists of patents in subclass:

(1) For list of all United States patents in a subclass, per 100 patent numbers or fraction thereof---------- $ 2.00

(2) For list of United States patents in a subclass limited by date or patent number, per 50 patent numbers or fraction thereof--------- $ 2.00.

8. A new §1.20 is added which reads as follows:

§1.20 Post-issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§1.323)---------- $ 40.00

(b) Petition for correction of inventorship in patent (§1.324)---------- $ 120.00

(c) For filing a request for reexamination (§1.510(a))---------- $1,500.00

(d) For filing each statutory disclaimer (§1.321):

By a small entity (§1.9(f))---------- $ 25.00
By other than a small entity---------- $ 50.00

(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant---------- $ 200.00

(f) For maintaining an original or reissue patent, except a design patent, based

on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant---------- $ 400.00

(g) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant---------- $ 600.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 200.00
By other than a small entity---------- $ 400.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 400.00
By other than a small entity---------- $ 800.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 600.00
By other than a small entity---------- $1200.00.

9. Section 1.21 is revised to read as follows:

§1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:

(1) For admission to examination for

registration to practice, fee payable upon application---------- $75.00

(2) On registration to practice---------- $50.00

(3) For reinstatement to practice---------- $25.00

(4) For certificate of good standing as an attorney or agent---------- $10.00

(b) Deposit accounts:

(1) For establishing or reinstating a deposit account---------- $10.00

(2) Service charge for each month when the balance at the end of the month is below $40---------- $ 2.00

(c) Disclosure document:

For filing a disclosure document---------- $10.00

(d) Delivery box:

Local delivery box rental, per annum---------- $24.00

(e) International-type search reports:

For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application---------- $25.00

(f) Search of Office records:

For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof---------- $10.00

(g) Copy machine tokens:

Token for copying machine, each---------- $ 0.20

(h) Recording of documents:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or application---------- $20.00

(2) Where a document to be recorded under paragraph (h)(1) of this section refers to more than one patent or application, for each additional patent or application--------- $ 5.00

(i) Publication in Official Gazette:

For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent---------- $ 6.00

(j) For a duplicate or replacement of a permanent Office user pass (There is no charge for the first permanent user pass).-------- $ 5.00

(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this section, such charges as may be determined by the Commissioner with respect to each such item or service---------- actual cost.

10. Section 1.24 is revised to read as follows:

§1.24 Coupons.

Coupons in denominations of forty cents and one dollar are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents and trademark registrations; these coupons may not be used for any other purpose. The 40-cent coupons are sold individually and in books of 50 with stubs for record for $20. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50. These coupons are good until used; they may be transferred but cannot be redeemed.

11. Section 1.25 is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $50 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all services, copies, etc., requested must always be on deposit. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $40.

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts. A general authorization to charge all fees, or only certain fees, set forth

in §§1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination.

12. Section 1.26 is revised to read as follows:

§1.26 Refunds.

(a) Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw an application, an appeal, or a request for oral hearing, will not entitle a party to demand such a return. Amounts of one dollar or less will not be returned unless specifically demanded within a reasonable time, nor will the payer be notified of such amount; amounts over one dollar may be returned by check or, if requested, by credit to a deposit account.

(b) [Reserved]

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,200.00 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

13. Section 1.45 is amended by revising paragraphs (b) and (c) to read as follows:

§1.45 Joint inventors.

* * * * *

(b) If an application for patent has been made through error and without any deceptive intention by two or more persons as joint inventors when they were not in fact joint inventors, the application may be amended to remove the names of those not inventors upon filing of a petition including a statement of the facts verified by all of the original applicants, the required fee (§1.17(h)), and an oath or declaration as required by §1.65 by the applicant who is the actual inventor, provided the amendment is diligently made. Such amendment must have the written consent of any assignee.

(c) If an application for patent has been made through error and without any deceptive intention by less than all the actual joint inventors, the application may be amended to include all the joint inventors upon filing of a petition including a statement of the facts verified by, and an oath or declaration as required by §1.65 executed by all the actual joint inventors, along with

the required fee (§1.17(h)), provided the amendment is diligently made. Such amendment must have the written consent of any assignee.

14. Section 1.47 is revised to read as follows:

§1.47 Filing when an inventor refuses to sign or cannot be reached.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the omitted inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and by the required fee (§1.17(h)) and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.65. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and by the required fee (§1.17(h)) and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.65. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

15. Section 1.51 is amended by revising paragraph (a)(4) and by adding a new paragraph (c) to read as follows:

§1.51 General requisites of an application.

(a) * * *

(4) The prescribed filing fee, see §1.16.

* * * * *

(c) Applicants may desire and are permitted to file with, or in, the application an authorization to charge, at any time during the pendency of the application, any fees required under any of §§1.16 to 1.18 to a deposit account established and maintained in accordance with §1.25.

16. Section 1.52 is amended by revising paragraph (a) and by adding a new paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in §1.69 and paragraph (d) of this section, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

(d) An application including a signed oath or declaration may be filed in a language other than English if it is accompanied by the fee set forth in §1.17(k). A verified English translation of the non-English language application is required to be filed with the application or within such time as may be set by the Office.

17. Section 1.55 is amended by revising paragraph (b) to read as follows:

§1.55 Serial number and filing date of application.

* * * * *

(b) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application

is referred to in the oath or declaration as required by §1.65. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in §1.17(i).

* * * * *

18. Section 1.66 is revised to read as follows:

§1.66 Officers authorized to administer oaths.

(a) The oath or affirmation may be made before any person within the United States authorized by law to administer oaths . An oath made in a foreign country may be made before any diplomatic or consular officer of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority shall be proved by a certificate of a diplomatic or consular officer of the United States, or by an apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States. The oath shall be attested in all cases in this and other countries, by the proper official seal of the officer before whom the oath or affirmation is made. Such oath or affirmation shall be valid as to execution if it complies with the laws of the State or country where made. When the person before whom the oath or affirmation is made in this country is not provided with a seal, his official character shall be established by competent evidence, as by a certificate from a clerk of a court of record or other proper officer having a seal.

(b) When the oath is taken before an officer in a country foreign to the United States, any accompanying application papers, except the drawings, must be attached together with the oath and a ribbon passed one or more times through all the sheets of the application, except the drawings, and the ends of said ribbon brought together under the seal before the latter is affixed and impressed, or each sheet must be impressed with the official seal of the officer before whom the oath is taken. If the papers as filed are not properly ribboned or each sheet impressed with the seal, the case will be accepted for examination, but before it is allowed, duplicate papers, prepared in compliance with the foregoing sentence, must be filed.

19. Section 1.75 is amended by revising paragraph (c) to read as follows:

§1.75 Claim(s).

* * * * *

(c) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes under §1.16, a multiple dependent claim will be considered to be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. In addition to the other filing fees, any original application which is filed with, or is amended to include, multiple dependent claims must have paid therein the fee set forth in §1.16(d). Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

* * * * *

20. Section 1.85 is revised to read as follows:

§1.85 Informal drawings.

The requirements of §1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for reproduction, may be admitted but in such case the drawing must be corrected or a new one furnished, as required.

§1.86 [Removed]

21. Section 1.86 is removed.

22. Section 1.102 is amended by revising paragraph (a) and adding new paragraphs (c) and (d) to read as follows:

§1.102 Advancement of examination.

(a) Applications will not be advanced out of turn for examination or for further action except as provided by this part, or upon order of the Commissioner to expedite the business of the Office, or upon filing of a request under paragraph (b) of this section or upon filing a petition under paragraphs (c) or (d) of this section with a verified showing which, in the opinion of the Commissioner, will justify so advancing it.

* * * * *

(c) A petition to make an application special may be filed without a fee if the basis for the petition is the applicant's age or health or that the invention will materially enhance the quality of the environment or materially contribute to the development or conservation of energy resources.

(d) A petition to make an application special on grounds other than those referred to in paragraph (c) of this section must be accompanied by the petition fee set forth in §1.17(i).

23. Section 1.103 is amended by revising paragraphs (a) and (b) to read as follows:

§1.103 Suspension of action.

(a) Suspension of action by the Office will be granted for good and sufficient cause and for a reasonable time specified upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in §1.17(i). Action will not be suspended when a response by the applicant to an Office action is required.

(b) If action by the Office on an application is suspended when not requested by the applicant, the applicant shall be notified of the reasons therefor.

* * * * *

24. Section 1.104 is amended by revising paragraph (d) to read as follows:

§1.104 Nature of examination; examiner's action.

* * * * *

(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination on the merits, upon specific written request therefor and payment of the international-type search report fee. See §1.21(e) for amount of fee for preparation of international-type search report.

* * * * *

25. Section 1.134 is added and reads as follows:

§1.134 Time period for response to an Office action.

An Office action will notify the applicant of any non-statutory or shortened statutory time period set for response to an Office action. Unless the applicant is notified in writing that response is required in less than six months, a maximum period of six months is allowed.

26. Section 1.135 is amended by revising paragraphs (a), (b) and (c) to read as follows:

§1.135 Abandonment for failure to respond within time period.

(a) If an applicant of a patent application fails to respond within the time period provided under §§1.134 and 1.136, the application will become abandoned unless an Office action indicates otherwise.

(b) Prosecution of an application to save it from abandonment pursuant to paragraph (a) of this section must include such complete and proper action as the condition of the case may require. The admission of an amendment not responsive to the last Office action, or refusal to admit the same, and any proceedings relative thereto, shall not operate to save the application from abandonment.

(c) When action by the applicant is a bona fide attempt to respond and to advance the case to final action, and is substantially a complete response to the Office action, but consideration of some matter or compliance with some requirement has been inadvertently omitted, opportunity to explain and supply the omission may be given before the question of abandonment is considered.

* * * * *

27. Section 1.136 is revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the

request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings.

28. Section 1.137 is revised to read as follows:

§1.137 Revival of abandoned application.

(a) An application abandoned for failure to prosecute may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an abandoned application must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by a showing of the causes of the delay, by the proposed response unless it has been previously filed, and by the petition fee set forth in §1.17(l). Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) An application unintentionally abandoned for failure to prosecute may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date of abandonment of the application. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in §1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three month period set forth in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

(c) Any petition pursuant to paragraph (a) of this section not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application.

29. Section 1.155 is revised to read as follows:

§1.155 Issue and term of design patents.

(a) If, on examination, it shall appear that the applicant is entitled to a design patent under the law, a notice of allowance will be sent to the applicant, or applicant's attorney or agent, calling for the payment of the issue fee (§1.18(b)). If this issue fee is not paid within 3 months of the date of the notice of allowance, the application shall be regarded as abandoned.

(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for delayed payment (§1.17(l)), and (3) a showing that the delay was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date of abandonment of the application. The petition to accept the delayed payment must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for unintentionally delayed payment (§1.17(m)), and (3) a statement that the delay was unintentional. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three-month period from the date of the first decision referred to in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application.

30. Section 1.165 is amended by revising paragraph (b) to read as follows:

§1.165 Drawings.

* * * * *

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings must be submitted. Color drawings may be made either in permanent water color or oil, or in lieu thereof may be photographs made by color photography or properly colored on sensitized paper. Permanently mounted color photographs are acceptable. The paper in any case must correspond in size, weight and quality to the paper required for other drawings. See §1.84.

31. Section 1.171 is revised to read as follows:

§1.171 Application for reissue.

An application for reissue must contain the same parts required for an application for an original patent, complying with all the rules relating thereto except as otherwise provided, and in addition, must comply with the requirements of the rules relating to reissue applications. The application must be accompanied by a certified copy of an abstract of title or an order for a title report accompanied by the fee set forth in §1.19(b)(2), to be placed in the file, and by an offer to surrender the original patent (§1.178).

32. Section 1.177 is revised to read as follows:

§1.177 Reissue in divisions.

The Commissioner may, in his or her discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for each division. Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts, subject to the provisions of §§1.83 and 1.84. On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner upon petition and payment of the fee set forth in §1.17(i), all the divisions of a reissue will issue simultaneously; if there be any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner shall otherwise order.

33. Section 1.181 is amended by revising paragraphs (d) and (g) to read as follows:

§1.181 Petition to the Commissioner.

* * * * *

(d) Where a fee is required for a petition to the Commissioner the appropriate section of this part will so indicate. If any

required fee does not accompany the petition, the petition will be dismissed.

* * * * *

(g) The Commissioner may delegate to appropriate Patent and Trademark Office officials the determination of petitions.

34. Section 1.182 is revised to read as follows:

§1.182 Questions not specifically provided for.

All cases not specifically provided for in the regulations of this part will be decided in accordance with the merits of each case by or under the authority of the Commissioner, and such decision will be communicated to the interested parties in writing. Any petition seeking a decision under this section must be accompanied by the petition fee set forth in §1.17(h).

35. Section 1.183 is revised to read as follows:

§1.183 Suspension of rules.

In an extraordinary situation, when justice requires, any requirement of the regulations in this part which is not a requirement of the statutes may be suspended or waived by the Commissioner or the Commissioner's designee, sua sponte, or on petition of the interested party, subject to such other requirements as may be imposed. Any petition under this section must be accompanied by the petition fee set forth in §1.17(h).

36. Section 1.191 is amended by revising paragraph (a) to read as follows:

§1.191 Appeal to Board of Appeals.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected, or who has been given a final rejection (§1.113), may, upon the payment of the fee set forth in §1.17(e), appeal from the decision of the examiner to the Board of Appeals within the time allowed for response.

* * * * *

37. Section 1.192 is amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied

by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved. The time periods set forth herein are subject to the provisions of §1.136.

* * * * *

38. Section 1.194 is amended by revising paragraphs (b) and (c) to read as follows:

§1.194 Oral hearing.

* * * * *

(b) If appellant desires an oral hearing, appellant must file a written request for such hearing accompanied by the fee set forth in §1.17(g) within one month after the date of the examiner's answer. If appellant requests an oral hearing and submits therewith the fee set forth in §1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.

(c) If no request and fee for oral hearing have been timely filed by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing and has submitted the fee set forth in §1.17(g), a day of hearing will be set, and due notice thereof given to the appellant and to the primary examiner. Hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for the appellant and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins.

39. Section 1.197 is amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. Such time may be extended under the provisions of §1.136.

* * * * *

40. Section 1.231 is amended by revising paragraph (a)(1) to read as follows:

§1.231 Motions before the primary examiner.

(a) Within the period set in the notice of interference for filing motions any party to an interference may file a motion seeking:

(1) To dissolve as to one or more counts, except that such motion based on facts sought to be established by affidavits, declarations or evidence outside of official records and printed publications will not normally be considered. A motion to dissolve an interference in which a patentee is a party on the ground that the claims corresponding to the counts are unpatentable to the patentee over patents or printed publications will be considered through reexamination if it complies with the requirements of §1.510(b) and is accompanied by the fee for requesting reexamination set in §1.20(c). Otherwise, a motion to dissolve an interference in which a patentee is a party will not be considered if it would necessarily result in the conclusion that the claims of the patent which correspond to the counts are unpatentable to the patentee on a ground which is not ancillary to priority. Where a motion to dissolve is based on prior art, service on opposing parties must include copies of such prior art. A motion to dissolve on the ground that there is no interference in fact will not be considered unless the interference involves a design or plant patent or application or unless it relates to a count which differs from the corresponding claim of an involved patent or of one or more of the involved applications as provided in §§1.203(a) and 1.205(a).

* * * * *

41. Section 1.245 is revised to read as follows:

§1.245 Extension of time.

Extensions of time in any interference proceeding not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extension. The provisions of §1.136 do not apply to time periods in interferences.

42. Section 1.246 is revised to read as follows:

§1.246 Late papers.

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§1.68), of sufficient cause as to why such motion or paper was not timely presented. The provisions of §1.136 do not apply to time periods in interferences.

43. Section 1.263 is revised to read as follows:

§1.263 Statutory disclaimer by patentee.

The disclaimer referred to in §1.262, when made by a patentee in interference is not a disclaimer under 35 U.S.C. 253. If a

disclaimer under the statute and the fee set forth in §1.20(d) (see §1.321) cancelling claims involved in the interference from the patent, is made by the patentee, including all assignees as shown by the records of the Patent and Trademark Office, the interference will be dissolved pro forma as to such claims.

44. Section 1.268 is added to read as follows:

§1.268 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof filed in the Patent and Trademark Office, directed to the Board of Patent Interferences, before the termination of the interference as between the said parties to the agreement or understanding.

(b) If any party filing the agreement or understanding pursuant to paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in §1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding pursuant to paragraph (a) of this section, will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commissioner may, however, upon petition accompanied by the fee set forth in §1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six-month period subsequent to the termination of the interference as between the parties to the agreement or understanding.

45. Section 1.292 is amended by revising paragraph (a) to read as follows:

§1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations and the fee set forth in §1.17(j) is filed by one having information of the pendency of an application and is found, on reference to the primary examiner, to make a prima facie showing that the invention involved in an interference or claimed in an application believed to be on file had been in public use or on sale one year before the filing of the application, or before the date alleged by an interfering party in his or her preliminary statement or the date of invention established by such party, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted,

times may be set for taking testimony, which shall be taken as provided by §§1.271 to 1.286. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

46. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to §1.197(b) or §1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of §1.136.

* * * * *

47. Section 1.311 is revised to read as follows:

§1.311 Notice of allowance.

(a) If, on examination, it shall appear that the applicant is entitled to a patent under the law, a notice of allowance will be sent to applicant at the correspondence address indicated in §1.33, calling for the payment of a specified sum constituting the issue fee (§1.18), which shall be paid within 3 months from the date of the mailing of the notice of allowance.

(b) An authorization to charge the issue fee (§1.18) to a deposit account may be filed in an individual application, either before or after mailing of the notice of allowance. Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of the notice of allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance.

48. Section 1.312 is revised to read as follows:

§1.312 Amendments after allowance.

(a) No amendment may be made as a matter of right in an application after the mailing of the notice of allowance. Any amendment pursuant to this paragraph filed before the payment of the issue fee may be entered on the recommendation of the primary examiner, approved by the Commissioner, without withdrawing the case from issue.

(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in §1.17(i) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

49. Section 1.313 is revised to read as follows:

§1.313 Withdrawal from issue.

(a) Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant. Any such petition by the applicant must include a showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in §1.17(i). If the application is withdrawn from issue, a new notice of allowance will be sent if the application is again allowed. Any amendment accompanying a petition to withdraw an application from issue must comply with the requirements of §1.312.

(b) When the issue fee has been paid, and the patent to be issued has received its issue date and patent number, the application will not be withdrawn from issue for any reason except (1) mistake on the part of the Office, (2) a violation of §1.56 or illegality in the application, (3) unpatentability of one or more claims, or (4) for interference.

50. Section 1.314 is revised to read as follows:

§1.314 Issuance of patent.

If payment of the issue fee is timely made, the patent will issue in regular course unless (a) the application is withdrawn from issue (§1.313) or (b) issuance of the patent is deferred. Any petition by the applicant requesting deferral of the issuance of a patent must be accompanied by the fee set forth in §1.17(i) and must include a showing of good and sufficient reasons why it is necessary to defer issuance of the patent.

51. Section 1.316 is revised to read as follows:

§1.316 Application abandoned for failure to pay issue fee.

(a) If the issue fee is not paid within 3 months from the date of the notice of allowance, the application will be regarded as abandoned. Such an abandoned application will not be considered as pending before the Patent and Trademark Office.

(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed

after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for delayed payment (§1.17(l)), and (3) a showing that the delay was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date of abandonment of the application. The petition to accept the delayed payment must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for unintentionally delayed payment (§1.17(m)), and (3) a statement that the delay was unintentional. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three-month period from the date of the first decision referred to in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application.

52. Section 1.317 is revised to read as follows:

§1.317 Lapsed patents; delayed payment of balance of issue fee.

(a) If the issue fee was paid prior to October 1, 1982, any remaining balance of the issue fee is to be paid within three months from the date of notice thereof and, if not paid, the patent will lapse at the termination of the three month period.

(b) The Commissioner may accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the lapse, and must be accompanied by

(1) the remaining balance of the issue fee, unless it has been previously submitted, (2) the fee for delayed payment (§1.17(l)), and (3) a showing that the delay was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the remaining balance of the fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be filed within one year of the date on which the patent lapsed or be filed within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date of lapse of the patent. The petition to accept the delayed payment must be accompanied by (1) the remaining balance of the issue fee, unless it has been previously submitted, (2) the fee for unintentionally delayed payment (§1.17(m)), and (3) a statement that the delay was unintentional. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay in payment was unintentional. The three-month period from the date of the first decision referred to in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting acceptance of an unintentionally delayed payment will not be considered, but will be returned to the applicant.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of lapse must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of the patent equivalent to the period of lapse of the patent.

53. Section 1.321 is revised to read as follows:

§1.321 Statutory disclaimer.

(a) A disclaimer under 35 U.S.C. 253 must be accompanied by the fee set forth in §1.20(d) and identify the patent and the claim or claims which are disclaimed, and be signed by the person making the disclaimer, who shall state therein the extent of his or her interest in the patent. A disclaimer which is not a disclaimer of a complete claim or claims may be refused recordation. A notice of the disclaimer is published in the Official Gazette and attached to the printed copies of the specification. In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

(b) A terminal disclaimer, when filed in an application to obviate a double patenting rejection, must be accompanied by the fee set forth in §1.20(d) and include a provision that any patent granted on that application shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

54. Section 1.324 is revised to read as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that there was a misjoinder or nonjoinder of inventors and that such misjoinder or omission occurred by error and without deceptive intention, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate deleting the misjoined inventor from the patent or adding the non-joined inventor to the patent.

55. Section 1.331 is amended by revising paragraph (a) to read as follows:

§1.331 Recording of assignments.

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America, will be recorded in the Patent and Trademark Office under 35 U.S.C. 261. Other instruments affecting title to a patent, a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or at the discretion of the Commissioner. Any instrument to be recorded, except those under Part 7 of this title, must be accompanied by the fee set forth in §1.21(h).

* * * * *

56. Section 1.332 is revised to read as follows:

§1.332 Receipt and recording.

Assignments are recorded in regular order as promptly as possible, and then transmitted with the date and identification of the record stamped thereon to the persons entitled to them. The date of the record is the date of the receipt of the assignment at the Office in proper form and accompanied by the fee set forth in §1.21(h).

57. Section 1.334 is revised to read as follows:

§1.334 Issue of patent to assignee.

(a) In case of an assignment of the entire interest in the invention and application, or of the entire interest in the patent to be granted, the patent will normally issue to the assignee. If the assignee should hold an undivided part interest, the patent will normally issue jointly to the inventor and the assignee. If it is desired that the patent so issue, the assignment in either case must first have been recorded, and at a day not later than the date payment is made of the issue fee.

(b) At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent and Trademark Office. In the event an assignment has been filed, such statement must include the name and address of the assignee and indicate whether or not an acknowledgement of a recorded assignment has been received from the Patent and Trademark Office.

(c) If the assignment is recorded after the date of payment of the issue fee, the assignee may petition that the patent issue to the assignee as recorded. Any such petition must be accompanied by the fee set forth in §1.17(i).

58. Section 1.341 is amended by revising paragraph (h) to read as follows:

§1.341 Registration of attorneys and agents.

* * * * *

(h) Oath and registration fee. Before his or her name may be entered on the register of attorneys or on the register of agents, every applicant for registration must, after his or her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner of Patents and Trademarks and pay the prescribed registration fee. (See §1.21(a)(2).)

* * * * *

59. Section 1.347 is revised to read as follows:

§1.347 Removing names from registers.

Attorneys and agents, registered to practice before the Patent and Trademark Office, should notify the Office of any change of address for entry on the register, by letter separate from any notice of change of address filed in individual applications. The Office may address a letter to any person on the registers, at the address of which separate notice for the register was last received, for the purpose of ascertaining whether such person desires to remain on the register. The name of any person failing to reply and give the information requested within a time limit specified will be removed from the register, and the names

so removed published in the Official Gazette. Any name so removed may be reinstated, either on the register of attorneys or the register of agents, as may be appropriate. Any request for reinstatement must be accompanied by the fee set forth in §1.21(a)(3).

60. Section 1.445 is amended by revising paragraphs (a)(1) through (4) to read as follows:

§1.445 International application filing and processing fees.

(a) * * *

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) ---------- $125.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with fee has been filed---------- $500.00

(ii) Corresponding prior United States national application with fee has been filed---------- $250.00.

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)----$125.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited by an amount of $250 where an international search fee has been paid on the corresponding international application to the United States as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single international search fee.

* * * * *

61. Section 1.446 is amended by revising paragraph (b) to read as follows:

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) Refund of a portion of the search fee may be made to the extent set forth in §1.445(a)(4) if requested at the time of paying the national fee.

* * * * *

62. Section 1.451 is amended by revising paragraph (b) to read as follows:

§1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in §1.19(a)(4) and (b)(1).

* * * * *

63. Section 1.510 is amended by revising paragraph (a) to read as follows:

§1.510 Request for reexamination.

(a) Any person may, at any time during the period of enforceability of a patent, file a request for reexamination by the Patent and Trademark Office of any claim of the patent on the basis of prior art patents or printed publications cited under §1.501. The request must be accompanied by the fee for requesting reexamination set in §1.20(c).

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

64. Section 2.6 is revised to read as follows:

§2.6 Trademark fees.

The following fees and charges are established by the Patent and Trademark Office for trademark cases:

(a)	For filing an application, per class	$175.00
(b)	For filing an application for renewal of a registration, per class	300.00
(c)	For filing to publish a mark under §12(c), per class	100.00
(d)	For issuing a new certificate of registration upon request of assignee	100.00
(e)	For a certificate of correction	

	of registrant's error----------	100.00
(f)	For filing a disclaimer to a registration----------	100.00
(g)	For filing an amendment to a registration----------	100.00
(h)	For filing an affidavit under §8 of the Act, per class----------	100.00
(i)	For filing an affidavit under §15 of the Act, per class----------	100.00
(j)	For filing a combined affidavit under §§8 and 15 of the Act, per class----------	200.00
(k)	For petitions to the Commissioner----------	100.00
(l)	For filing petition to cancel or notice of opposition, per class----------	200.00
(m)	For ex parte appeal to the Trademark Trial and Appeal Board, per class----------	100.00
(n)	For printed copy of registered mark Copy only---------- Copy showing title and/or status----------	 1.00 6.50
(o)	For certifying trademark records, per certificate----------	3.50
(p)	For photocopies or other reproductions of records, drawings, or printed material, per page of the material copied----------	.30
(q)	For recording trademark assignments, per document---------- For each mark in addition to one assigned in the same document----------	100.00 20.00
(r)	For abstracts of title to each registration or application, including the search--------	12.00
(s)	For special service handling of late filed fees in connection with a renewal-----	100.00
(t)	For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service----------	actual cost.

65. Section 2.85 is amended by revising paragraph (e) to read as follows:

§2.85 Classification schedules.

* * * * *

(e) Where the amount of the fee received on filing an appeal in connection with an application or on an application for renewal or in connection with a petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or renewal application or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

* * * * *

66. Section 2.101 is amended by revising paragraph (c) to read as follows:

§2.101 Filing an opposition.

* * * * *

(c) If no fee, or a fee insufficient to cover at least one class, is filed within 30 days after publication of the mark to be opposed or within an extension of the time for filing an opposition, the opposition will not be refused if the required fee(s) (See §2.6) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office.

* * * * *

67. Section 2.146 is amended by revising paragraph (b) to read as follows, and by removing paragraph (f):

§2.146 Petition to the Commissioner.

* * * * *

(b) Any such petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested and the requisite fee (See §2.6). Any brief in support thereof should accompany or be embodied in the petition; in contested cases any brief in opposition shall be filed within fifteen days after service of the petition. Where facts are to be proved in ex parte cases (as in petition to revive an abandoned application), the proof in the form of affidavits or

declarations in accordance with §2.20 (and exhibits, if any) must accompany the petition.

* * * * *

68. Section 2.162 is amended by revising paragraph (d) to read as follows:

§2.162 Requirements for affidavit or declaration during sixth year.

* * * * *

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed before the expiration of the sixth year following the date of registration or of publication under Section 12(c) of the Act, the affidavit or declaration will not be refused if the required fee(s) (See §2.6) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified.

* * * * *

69. Section 2.167 is amended by adding a paragraph (g) as follows:

§2.167 Affidavit or declaration under Section 15.

* * * * *

(g) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed at an appropriate time, the affidavit or declaration will not be refused if the required fee(s) (See §2.6) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 24, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-18-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-13-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	4-09-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-07-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-27-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-24-82
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-27-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,192,536 to 3,197,783, inclusive

Plant Patents ..... Numbers 2,543 to 2,545 inclusive

REEXAMINATIONS

SEPTEMBER 28, 1982

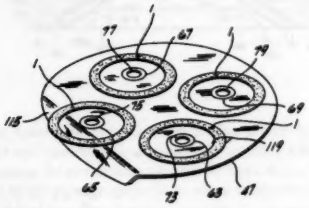
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,219,004 (20th)

FLEXIBLE, SELF-SUPPORTING BLADE FOR CUTTING ELECTRONIC CRYSTALS AND SUBSTRATES OR THE LIKE

Robert C. Runyon, St. Louis County, Mo., assignor to Chemet Research, Inc., Fenton, Mo.

Reexamination Request No. 90/000,105, Nov. 10, 1981.
Reexamination Certificate for Patent No. 4,219,004, issued Aug. 26, 1980, Ser. No. 961,946, Nov. 20, 1978.
U.S. Cl. 125/15. Int. Cl. B28D *1/04;* B05D *3/05.*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 2–18 is confirmed.

*Claim 1 is determined to be patentable as amended:

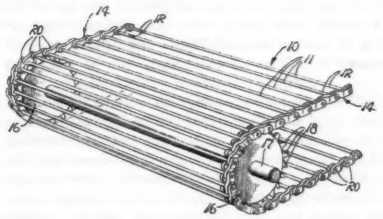
1. An extremely thin, flexible, [self-supporting] *free-standing* cutting blade *having* [of] a predetermined *annular,* disc-shaped form [having] *and* a thickness in the range of about 0.0006 inch to about 0.006 inch or more, the blade having fully exposed opposed lateral [sizes] *sides* and a fully exposed peripheral *portion, the outer portion of each lateral side and the peripheral portion forming a* cutting portion for dicing or sawing electronic crystal substrates, or the like, the blade throughout its *entirety* [thickness extending between the lateral sides thereof] comprising a metal matrix and diamond particle cutting elements disposed substantially throughout the matrix, *a portion of a substantial number of the diamond particle cutting elements being exposed throughout each lateral side of the blade,* [the inner portion of each of the exposed sides of] the blade being adapted to be engaged by mounting means *which are independent of the blade such* [in order] that the [outer peripheral] cutting portion remains exposed for *dicing or sawing* [cutting upon engagement of the blade by the mounting means], the blade being made by electrodeposition of a matrix of metal as an extremely thin layer of metal in the predetermined *annular,* disc-shaped form upon a surface of a flat, electrically conductive substrate immersed in a suspension having the diamond particle cutting elements dispersed within an electrolyte, the diamond particle cutting elements being codeposited in the matrix of metal during electrodeposition thereof *to an extent that the portion of the substantial number of diamond particle cutting elements are exposed throughout each lateral side of the blade,* the matrix *of metal and codeposited diamond particle cutting elements in the annular, disc-shaped form with the portion of the substantial number of diamond particle cutting elements exposed throughout each lateral side of the blade* being separated from the substrate [after formation of the metal matrix with the diamond particle cutting elements disposed therein], thereby providing the extremely thin, flexible [self-supporting], *free-standing* cutting blade *with the portion of the substantial number of diamond particle cutting elements exposed throughout each lateral side of the blade.*

B1 3,160,264 (21st)

CONVEYOR CHAIN

Delmar H. Raybould, R.F.D. 2, Box 214A, Rexburg, Idaho. 83440

Reexamination Request No. 90/000,028, Jul. 16, 1981.
Reexamination Certificate for Patent No. 3,160,264, issued Dec. 8, 1964, Ser. No. 251,887, Jan. 16, 1963.
U.S. Cl. 198/851. Int. Cl.[3] B65G 17/06.



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 having been determined to be unpatentable, are cancelled.

1. A conveyor chain comprising a plurality of substantially parallel flight rods having opposite end portions; a plurality of substantially identical elongated links interconnecting corresponding ends of the adjacent rods in an endless chain, each link having an outer end providing an inwardly disposed bearing surface, an inner end longitudinally spaced from said outer end providing an outwardly disposed bearing surface in a plane common to the inwardly disposed bearing surface of the outer end, a central portion integrally interconnecting the outer and inner ends and a pair of substantially parallel bores individually extended through the opposite ends of the links, the links having opposite ends journaled on corresponding ends of adjacent rods, the inner ends of the links being outwardly overlapped by the outer ends of adjacent links; and link restraining means mounted on the rods between the overlapped ends of the links.

REISSUES

SEPTEMBER 28, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

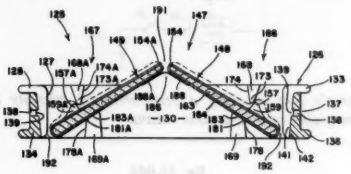
Re. 31,040
HEART VALVE PROSTHESIS

Zinon C. Possis, Edina, Minn., assignor to St. Jude Medical, Inc., St. Paul, Minn.

Original No. 4,078,268, dated Mar. 14, 1978, Ser. No. 720,776, Sep. 7, 1976. Continuation-in-part of Ser. No. 571,285, Apr. 24, 1975, abandoned. Application for reissue Feb. 15, 1980, Ser. No. 121,674

Int. Cl.[3] **A61F** *1/22*

U.S. Cl. 3—1.5 **82 Claims**



65. A heart valve prosthesis comprising: a base having an inside annular wall surrounding a passage for carrying blood through the base, means for connecting the base to heart tissue, valving means located in the passage operable to allow substantially unrestricted flow of blood in a first direction through the passage and to restrict the flow of blood in a second direction through the passage, said second direction being opposite the first direction, said valving means comprising a first valving member having a convex curved edge and a transverse edge, and a second valving member having a convex curved edge and a transverse edge, said first and second valving members when in their closed positions being obliquely inclined in opposite directions with respect to the longitudinal axis of the passage through the base, and said transverse edges being located adjacent each other, each valving member having an outer periphery having portions thereof spaced from the inside annular wall to allow limited flow of blood in the second direction between the valving members and the inside annular wall when the valving members are in their closed positions, first ear means on the first valving member, first pivot means pivotally connecting the first valving member to the base for movement about a first axis offset in one direction from the center of the passage, said first pivot means including said first ear means and first fulcrum portions on the base, said first ear means being engageable with the first fulcrum portions for controlling the movement of the first valving member between its open and closed positions, second ear means on the second valving member, and second pivot means pivotally connecting the second valving member to the base for movement about a second axis offset in a direction opposite the one direction from the center of the passage, said second pivot means including said second ear means and second fulcrum portions on the base, said second ear means being engageable with the second fulcrum portions for controlling the movement of the second valving member between its open and closed positions, said first and second axes being generally parallel to each other, said base including a first side member and a second side member, said first and second side members forming barriers adjacent opposite sides of the first and second valving members when the valving members are in their closed positions to minimize the flow of blood through the passage in the second direction, first stop means engageable with the first valving member and second valving member to hold the first valving member and second valving member in their closed positions to restrict the flow of blood in the second direction through the passage, and second stop means engageable with the first valving member and second valving member when the valving members are in their open positions to allow substantially free flow of blood through the passage in the first direction.

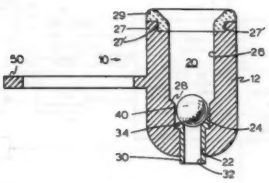
Re. 31,041
YARN TENSIONING DEVICE

Otto Zollinger, Spartanburg, S.C., assignor to Otto Zollinger, Inc., Spartanburg, S.C.

Original No. 3,874,613, dated Apr. 1, 1975, Ser. No. 381,979, Jul. 23, 1973. Continuation-in-part of Ser. No. 297,995, Oct. 16, 1972, Pat. No. 3,753,535. Application for reissue Oct. 19, 1978, Ser. No. 952,939

Int. Cl.[3] **B65H** *59/22*

U.S. Cl. 242—152.1 **30 Claims**



1. A tension device comprising:

a. a housing, said housing having a yarn passageway extending therethrough, said yarn passageway having a large diameter section and a small diameter section, an [outer] *upper* end of said large diameter section of passageway having rounded abrasion resistant corners;

b. *a first insert defining* an uninterrupted seat provided along said passageway at the junction of said large and small diameter sections and having an opening therethrough, said seat receiving a spherical element thereat and holding said spherical element out of contact with walls of said large diameter section of said passageway when no yarn is passing through said opening, said seat having surfaces around said opening with a radius of curvature opposite the curvature of said spherical element; and

c. a spherical element receivable in said large diameter section of said passageway, said spherical element having a diameter less than the length of said large diameter section and said large diameter section having a diameter adjacent said seat to prohibit substantial lateral movment of said spherical element received thereat *said passageway being smooth surfaced and substantially unrestricted upwardly from said seat for a distance sufficient to permit substantially unrestricted upward movement of said spherical element during tensioning of a yarn.*

Re. 31,042
LASER CUTTING HEAD ATTACHMENT FOR PUNCH PRESSES

Stephen C. Clark, East Amherst, and Victor T. Carbone, Cheektowaga, both of N.Y., assignors to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Original No. 4,201,905, dated May 6, 1980, Ser. No. 937,754, Aug. 29, 1978. Application for reissue Oct. 22, 1980, Ser. No. 199,631

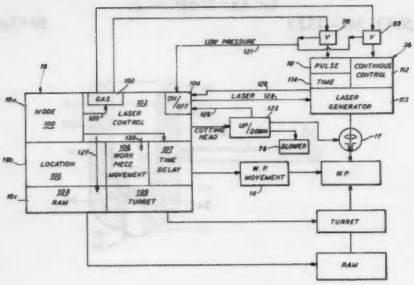
Int. Cl.[3] **B23K** *26/00*

U.S. Cl. 219—121 LG **11 Claims**

1. In a machine tool punch press having a main frame, main frame carried upper and lower spaced rotatable turrets respectively carrying punch tools and die tools, a main frame carried

vertically reciprocatable punch ram stationed at a work station, a worktable extending outwardly from adjacent the lower turret at least to the sides and front thereof having at least a stationary portion adjacent the lower turret, the stationary portion aligned with the work station and spaced to a side thereof, a central automatic control controlling the turrets and punch ram and further controlling workpiece movement apparatus effective to move a workpiece with respect to at least the stationary portion of the worktable and the work station, the improvement of:

(a) a vertically movable laser cutting head carried by the main frame above the stationary portion of the worktable, the cutting head including a hollow tip assembly adjacent the bottom thereof and a beam focusing optical means adjustably fixably spaced from a bottom of the tip assembly and vertically movable with the cutting head,



(b) a laser beam generator, the laser beam generator being spaced from the machine tool punch press and main frame and being substantially isolated therefrom whereby vibration of the machine tool punch press is isolated from the beam generator,

(c) an optical beam pathway interconnecting the cutting head and the laser beam generator, the pathway including beam bending optics directing a laser beam through the tip, an opening through the stationary portion of the worktable aligned with the laser beam eminating from the hollow tip,

(d) a control means automatically alternatively controlling punching operation and laser operation from said central automatic control, said control means including means for vertically moving the cutting head in dependent relationship to selection of laser operation, said control means being a portion of said central control.

Re. 31,043

MASS SPECTROMETER BEAM MONITOR

Charles R. McKinney, Monrovia, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,099,052, dated Jul. 4, 1978, Ser. No. 748,298, Dec. 7, 1976. Application for reissue Mar. 13, 1979, Ser. No. 20,249

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—283 **9 Claims**

12. An ion beam analyzer having an ion source for generating ions of a sample to be analyzed, comprising, in combination,

means for extracting said sample ions from said source,

means for focusing the extracted sample ions into a beam,

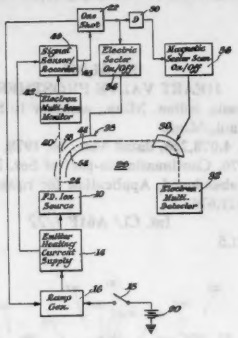
separation means capable of being energized or de-energized to selectively deflect or not to deflect species of extracted ions in said beam,

detecting means positioned for detecting the selected deflected species of ions,

means to energize or de-energize said separation means,

sensing means located along the ion beam for sensing said extracted sample ions prior to deflection, and

control means coupled between said sensing means and said means to energize or de-energize and responsive to said sensed



sample ions reaching a predetermined intensity level for energizing said separation means.

Re. 31,044

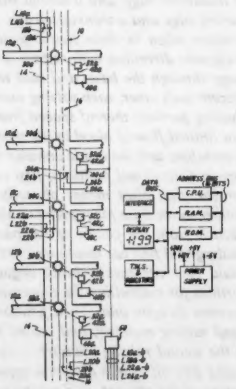
TRAFFIC COORDINATOR FOR ARTERIAL TRAFFIC SYSTEM

Marshall B. McReynolds, Arlington, Va.; Irving S. Oscar, Washington, D.C., and Jack Van Tilbury, Arlington, Va., assignors to TRAC, Inc., Alexandria, Va.

Original No. 4,167,785, dated Sep. 11, 1979, Ser. No. 843,729, Oct. 19, 1977. Application for reissue Sep. 9, 1980, Ser. No. 185,437

Int. Cl.³ G06F *15/48*; G08G *1/08*

U.S. Cl. 364—437 **130 Claims**



120. A coordinator for coordinating traffic at least along an artery having traffic lights at a plurality of intersections along said artery, said coordinator comprising:

(a) a digital computer means for calculating values corresponding to cycle length green times, said green time values calculated in real-time in response at least to traffic flowing along one intersection of said plurality of intersections of said artery,

(b) means connected to said calculating means for controlling traffic signals at said one intersection for implementing a green time value equal to at least said calculated green time value at said one intersection to thereby define a platoon of vehicles at said one intersection,

(c) means for setting a plurality of offset times, each offset time corresponding to the distance of each of the remainder of said

plurality of intersections from said one intersection, each offset time being a predetermined constant value in units of time, and

(d) means for controlling each of said plurality of traffic signals at the remainder of said plurality of intersections of said artery in a sequential and individual manner to implement an artery green time value equal to at least said calculated green time value, said green time value implemented at said fixed offset times at each of said remainder of intersections as platoons of vehicles approach said intersections to thereby coordinate traffic along said artery.

PLANT PATENTS

GRANTED SEPTEMBER 28, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,890

STRAWBERRY PLANT

Albert B. Cook, 320 N. Fifth St., Rockport, Ind. 47635

Filed Dec. 22, 1980, Ser. No. 218,732

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its high productivity, its very vigorous growth, and its large fruit.

4,891

CHRYSANTHEMUM NAMED ORANGE WESTLAND

Jacques C. M. van der Knaap, De Lier, Netherlands, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Oct. 2, 1980, Ser. No. 193,089

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized by its unique quill-shaped ray florets of a distinctive orange coloration.

PLANT PATENTS

GRANTED SEPTEMBER 26, 1961

PATENTS

GRANTED SEP. 28, 1982

ERRATA

For CLASS	See PATENT NO.
464–024	4,351,167
464–064	4,351,168
126–197	4,351,288
524–008	4,351,750
524–375	4,351,751
523–401	4,351,752
524–445	4,351,754
524–555	4,351,755
524–314	4,351,756
524–169	4,351,757
524–227	4,351,758
524–100	4,351,759
548–567	4,351,770
549–361	4,351,771
549–331	4,351,772
549–259	4,351,773
204–159	4,351,884
378–018	4,352,020
378–012	4,352,021
378–144	4,352,041
378–029	4,352,185

PATENTS

GRANTED MAY 25, 1982

TO

DATA

PATENTS

GRANTED SEPTEMBER 28, 1982

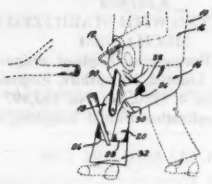
GENERAL AND MECHANICAL

4,351,065

PROTECTIVE GARMENT FOR THE USER OF A CHAIN SAW

Edgar Bouchard, Mitassini, Canada, assignor to Normand Bouchard, Quebec, Canada

Filed Feb. 25, 1981, Ser. No. 237,948
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—23 **11 Claims**



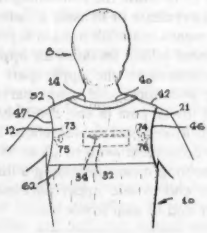
1. A garment for protecting the user of a chain saw wherein at least one section of the garment comprises: an outer layer of canvas material; a pad including a plurality of superposed plies of canvas material sewn together to said outer layer, and at least one additional layer of canvas material loosely attached in said pad so that said additional layer may be readily pulled out when seized accidently and entrained by the chain of the saw, to subsequently jam and stop the operation of the saw chain.

4,351,066

DUAL PURPOSE JACKET

Wally Pearsall, 110 E. 9th St., Los Angeles, Calif. 90015

Continuation-in-part of Ser. No. 93,377, Nov. 13, 1979. This application Mar. 11, 1980, Ser. No. 129,346
Int. Cl.³ A41D *3/02*
U.S. Cl. 2—85 **5 Claims**



1. A foldable jacket or coat comprising:

(a) a conventional jacket including an upper back portion;

(b) a capelette extending over said upper back portion having its upper and side edges attached to said upper back portion by reinforcing means so as to form with said upper back portion, while attached to said upper back portion and folded back upon itself, a pouch into which the remainder of the coat can be inserted upon being folded;

(c) fastening means affixed to the jacket on each side thereof on the back and in between the capelette and the upper back portion; and

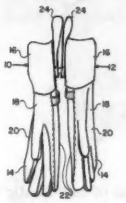
(d) strap means constructed and arranged to attach to said fastening means and to cooperate in length with the extent of the width of the folded jacket to encircle the body of the wearer.

4,351,067

WORK GLOVES WITH ATTACHMENT MECHANISM

Franklin D. Bartels, 495 E. Gail, Tulare, Calif. 93274

Filed Apr. 6, 1981, Ser. No. 251,349
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—160 **2 Claims**



1. A pair of gloves, comprising:

first and second hand receiving sheaths, each having a rearward wrist encircling portion having a front surface on the palm side and a rear surface on the back side;

a pair of strips made of a flexible material, each having a first end secured intermediate the rear surface of the wrist encircling portion of a corresponding one of the sheaths and extending rearwardly therefrom a distance sufficient to encircle a workman's belt, each strip further having a width at least one-third the width of the wrist encircling portion;

a first pair of mating hook weave connecting surfaces, one surface of the first pair being secured to the first end of a first one of the strips on the exposed first side of the first strip and the second one of the surfaces of the first pair being secured to the second end of the first strip on the first side thereof to permit mating connection of the first and second surfaces of the first pair when the first strip is folded away from the wrist encircling portion to which the first strip is secured to thereby form a loop;

a second pair of mating hook weave connecting surfaces, one surface of the second pair being secured to the first end of the second one of the strips on the exposed first side of the second strip and the second one of the surfaces of the second pair being secured to the second end of the second strip on the first side thereof to permit mating connection of the first and second surfaces of the second pair when the second strip is folded away from the wrist encircling portion to which it is secured to thereby form a loop; and

a third pair of mating hook weave connecting surfaces, one surface of the third pair being connected to the second end of the first strip on the second side thereof and the second surface of the third pair being connected to the second end of the second strip on the second side thereof;

whereby when the first pair of hook weave surfaces are connected and the second pair of hook weave surfaces are connected, the third pair of hook weave surfaces may be connected to removably hold the sheaths together.

4,351,068

PANTY HOSE GARMENTS

Dorothy L. Taylor, 25630 Southfield Rd., #201, Southfield, Mich. 48075

Filed Dec. 10, 1980, Ser. No. 215,013
Int. Cl.³ A41B *11/04*
U.S. Cl. 2—409 **1 Claim**

1. A panty hose made of knitted fabric and comprising a lower trunk section and two leg sections, the fabric being

knitted in 55–70 gauze and containing yarns in the 10–35 denier range, the leg sections terminating at a point between the knee and the ankle of a wearer, the point of termination being elastically secured to the leg of a wearer by an elastic hand, and the elastic band being superimposed over said fabric, secured at the point of termination by two parallel and spaced apart chain

stick seams at the edges of said elastic band and two zigzag seams each covering said chainstitch seams to prevent raw edges of the fabric at said points of termination and said chain stiches from unravelling, both of said chainstitch and zigzag seams being simultaneously expandable and contractable with an expansion or contraction of said elastic band, respectively.

4,351,069

PROSTHETIC DEVICES HAVING SINTERED THERMOPLASTIC COATINGS WITH A POROSITY GRADIENT

Nicolaas J. Ballintyn, Somerville, and Michael J. Michno, Jr., Bridgewater, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 53,192, Jun. 29, 1979, abandoned. This application Dec. 13, 1979, Ser. No. 103,399

Int. Cl.[3] **A61F** *1/24, 5/04;* **A61B** *17/18;* **A61C** *13/20*

U.S. Cl. 3—1.912 **20 Claims**

1. A prosthetic device comprised of a load bearing functional component and, over at least a portion thereof, a porous coating of a bioengineering thermoplastic material which is compatible with, and conducive for, the ingrowth of bone spicules, said material being selected from the group consisting of polysulfones, polyphenylenesulfides, polyacetals, thermoplastic polyesters, polycarbonates, aromatic polyamides, aromatic polyamideimides, thermoplastic polyimides, polyaryletherketones, polyarylethernitriles and aromatic polyhydroxyethers, and having the following properties:

(a) a substantial portion of the coating having an average pore diameter of from about 90 to about 600 microns;

(b) pore interconnections having average diameters of greater than about 50 microns,

(c) a modulus of elasticity from about 250,000 to about 500,000 pounds per square inch for non-reinforced, solid non-porous thermoplastic material, and from about 500,000 to about 3,000,000 pounds per square inch for reinforced, solid non-porous thermoplastic material;

(d) a total porosity of greater than about 20 percent and distributed such that a porosity gradient exists across the coating with the smallest pores on the side of the coating which contacts said load bearing functional component and the largest pores on the outer surface of the coating, and

(e) a total creep strain of the non-reinforced, solid, non-porous thermoplastic material of less than one percent at a constant stress of 1,000 pounds per square inch at ambient temperature, all of the properties being sufficient to enable stresses applied on the musculoskeletal system to be transferred to bone spicules within the pores of the material and maintain sufficient load and pore stability to promote irreversible ossification.

4,351,070

ARTIFICIAL LEG WITH STABILIZED KNEE MECHANISM

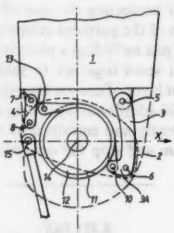
Brian G. Blatchford, Basingstoke, England, assignor to Chas. A. Blatchford & Sons Limited, Hampshire, England

Filed Sep. 4, 1980, Ser. No. 183,997

Claims priority, application United Kingdom, Sep. 7, 1979, 7931086

Int. Cl.[3] **A61F** *1/04, 1/08*

U.S. Cl. 3—27 **6 Claims**



1. An artificial leg for a wearer with an above-knee amputation comprising: a device for restraining knee flexion; means in which motion is produced in response to the application of torque about the natural hip axis of the wearer; and mechanical means which is adapted to apply said motion to the restraining device so as either (i) to cause the restraining device to restrain knee flexion or (ii) to release or to assist in releasing restraint of knee flexion, said means in which motion is produced being an upper leg component which includes an upper part, a lower part movably connected to the upper part and connecting means connecting said upper and lower parts and permitting movement of said lower part in the anterior/posterior direction such that said lower part moves about an instantaneous center of rotation coincident with or close to the said natural hip axis, said connecting means including a link pivotally connected at its upper end to said upper part and pivotally connected at its lower end to said lower part.

4,351,071

WATER-SAVING DEVICE

Milton Clar, 9408 Linden Ave., Bethesda, Md. 20014

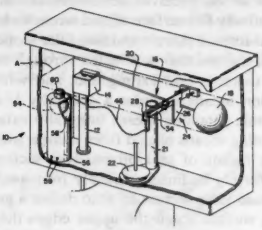
Filed Feb. 2, 1981, Ser. No. 230,538

Int. Cl.[3] **E03D** *1/14, 3/12*

U.S. Cl. 4—324 **14 Claims**

1. A water-saving device for use in a flush toilet tank having a water inlet valve controlled by a float, the device comprising a latch member, mounting means for mounting the latch member in the tank in operative relation with the float, for movement between a float-engaging position and a float-disengaging position, the latch member when in the engaging position being adapted to support the float in an inlet valve closing condition in opposition to a flush cycle-initiated drop in the tank water level tending to lower the float, the latch member when in the disengaging position being adapted to release the float for lowering movement in the tank to open the inlet valve, and

latch member control means for retaining the latch member in the float-engaging position until the tank water level drops by



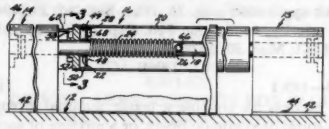
a predetermined amount and for then moving the latch member to the disengaging position.

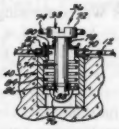
4,351,072

SEMI-AUTOMATIC POOL COVER

Marc Smith, Compton, Calif., assignor to Automatic Solar Covers, Inc., Compton, Calif.

Filed Aug. 11, 1980, Ser. No. 177,181
Int. Cl.³ E04H *3/16, 3/18*
U.S. Cl. 4—503 **6 Claims**





1. A pool cover for placement over a pool of water surrounded by a rigid deck comprising:

mounting brackets spaced apart from each other and secured to said deck along the sides of said pool,

a tubular roller having an axle fixedly secured at both ends to said mounting brackets, a drum rotatably mounted on said axle, and a spring acting between said axle and said drum to bias said drum to a retracted position,

a flexible, laminar, tarpaulin secured at one edge to said drum for rolled storage thereon and having an opposite free edge for lateral extension for use when withdrawn from said roller and defining spaced apertures within its perimeter at the edges thereof which are not secured to said drum, whereby withdrawal of said free edge of said tarpaulin from said roller deflects said spring to increase the force of its bias,

a unidirectional racket and pawl interposed between at least one of said mounting brackets and said drum and manually movable to an engaged position opposing the bias of said spring and preventing retraction of said tarpaulin while allowing the free withdraw of said tarpaulin from said drum against the bias of said spring, and to a disengaged position to allow retraction of said tarpaulin onto said drum as well as free withdrawal of said tarpaulin from said drum, and

a plurality of fasteners each having a downwardly extending projection adapted for insertion into said apertures in said tarpaulin and an upwardly extending grip engageable by the fingers of a user, and

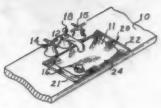
a plurality of anchors embedded in said deck at locations corresponding to the position of aperatures within the perimeter of said tarpaulin when said tarpaulin is extended from said drum, wherein said anchors are adapted to receive said downwardly extending projections in releasable latching engagement therewith and said fasteners are removable entirely from said anchors.

4,351,073

SAFETY NET FOR LAVATORY

Norman E. Elsas, Atlanta, Ga., assignor to Nemo Industries, Inc., Atlanta, Ga.

Filed Nov. 20, 1980, Ser. No. 208,689
Int. Cl.³ A47K *1/06;* A47L *19/02*
U.S. Cl. 4—654 **4 Claims**



1. In a lavatory including a bowl having a bottom, a water faucet, and controls for selectively causing water to flow through the water faucet and into said bowl, the combination therewith of a safety net receivable beneath said water faucet and above said bottom and extendable completely across said bowl from front to back thereof, said safety net further being extendable completely across said bowl from one side to the other, said safety net comprising flexible, porous material, and including generally rigid end members for retaining the said safety net in place, the arrangement being such that said flexible, porous material generally covers said bowl with said end members at the top of said bowl, said flexible, porous material extending into said bowl below said faucet to allow an object to be rinsed and above said bottom for allowing water flow through said flexible, porous material and into said bowl.

4,351,074

POLLEN TRAP

Charles H. Robson, 6241 S. 30th St., Phoenix, Ariz. 85040

Filed Feb. 23, 1981, Ser. No. 236,916
Int. Cl.³ A01K *47/06*
U.S. Cl. 6—1 **13 Claims**

1. Pollen trapping apparatus for placement at different levels in a segmented bee colony, said apparatus comprising:

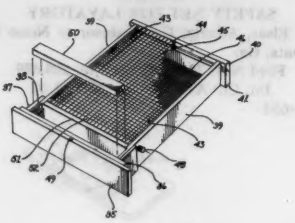
(a) a housing member having a front wall, opposing side walls and a back wall for insertion in a segmented bee colony, said housing being dimensioned to fit within the segmented colony;

(b) a drawer slidably mounted in said housing; and having a front member and opposing side members;

(c) a pollen trap contained within said drawer and being spaced from the front and back walls of said housing member to form first and second bee passageways respectively, said trap having a foraminous upper surface to permit the passage of pollen therethrough;

(d) scraper means movably mounted in said housing and being dimensioned to extend between the front and back

walls thereof, said means being spaced from adjacent portions of said front wall and positioned in overlying relationship to said drawer for removing the pollen from bees passing therethrough and being spaced from the upper surface of said pollen trap whereby pollen removed from the bees enters the pollen trap through the upper surface thereof, said scraper means being movable between first and second positions to control access to the second bee passageway, and



(e) means for receiving an entry blocking member in the front wall of said housing adjacent said scraper means to control the location of the bee entryway therein above and below said scraper means and permit non-trapping operation of said apparatus.

4,351,075

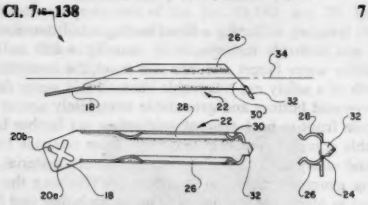
COMBINATION OIL PLUG WRENCH AND INTEGRAL OIL FILLER

Hal K. Pittard, Jr., 4201 Bland Rd., Raleigh, N.C. 27609

Filed Jun. 30, 1980, Ser. No. 164,672

Int. Cl.³ B25F *1/00*; B25B *13/48*

U.S. Cl. 7—138 **7 Claims**



1. A combination oil plug wrench and integral oil filler for tightening and disengaging an oil plug of the type provided with a lawn mower and including a cap having a top and upstanding projection turning means extending upwardly from said top and adapted to be engaged for turning said oil plug with said upstanding projection turning means being relatively thin compared to the top of said cap and including spaced apart opposed ends so as to define a relatively thin and elongated turning area between said opposed ends, and wherein said oil filler may be utilized to funnel or channel oil from a container into an opening normally occupied by said oil plug, said combination oil plug wrench and integral oil filler comprising: a wrench end having a relative flat surface with opening means formed therein for receiving and encasing said upstanding projection turning means extending upwardly from said oil cap and for turning the same as said wrench end is rotated, said opening means of said wrench end including an opening for receiving and encasing the relatively thin and elongated turning area between said opposed ends of said turning means; a combination wrench handle and an elongated U-shaped oil filler section integrally constructed with said wrench end and extending therefrom, said oil filler section including an open ended oil channeling surface, an oil exiting end, and side retaining means that extend about said oil channeling surface for constraining the oil to flow essentially down said oil channeling surface towards said oil exiting end, and wherein said oil channeling surface and said side retaining means thereof form an elongated, generally U-shaped and partially open trough structure; and an oil receiver section means interposed between the relatively flat surface of said wrench end having said opening means formed therein and said filler section for receiving oil poured therein that is directed through said U-shaped filler section towards said exiting end, and wherein said oil receiver section means includes a generally U-shaped cross section with side retaining means integrally extended to join said side retaining means of said filler section and wherein the side retaining means of said oil receiver section means are generally uniformly inclined upwardly from said flat wrench end towards said filler section so as to define a generally horizontal resting surface about the upper edges thereof for supporting said container when said combination oil plug wrench and oil filler section is disposed at an appropriate incline for filling purposes.

4,351,076

PROCESS FOR THE TREATMENT OF TEXTILES IN JET DYEING APPARATUSES

Hans-Ulrich von der Eltz, Frankfurt am Main, and Albert Reuther, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 121,825, Dec. 15, 1980, abandoned. This application Aug. 26, 1981, Ser. No. 296,494

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906161; Mar. 30, 1979, 2912768

Int. Cl.³ D06B *3/28*

U.S. Cl. 8—149.1 **12 Claims**

1. In a process for treating a textile material in rope form made of natural or synthetic fibers, or a mixture of such fibers, with a gaseous or liquid treating agent, or mixture of such agents, in a jet wet-processing apparatus, wherein the textile material rope to be treated is introduced into a vessel which can be tightly closed against the surrounding atmosphere and, in endless form, is circulated therein, at least for the duration of the treatment period, during which period the treating agent is circulated in the same direction, thereby effecting transportation of, and simultaneous action on, the textile material rope, the improvement which comprises,

instead of transporting the textile material rope, during all of said treatment period, by circulation of the liquid agent with which the textile material rope is in contact and in the process of exhausting,

transporting, at least in substantial part, the textile material rope into and through said apparatus and during at least part of said treatment period by means of tangential gas-impingement upon the rope in the direction of motion of the rope, said gas being heated and issuing under pressure from a nozzle or combination of nozzles in said apparatus and said gas, due to its temperature capacity and delivery, being capable of effecting affinity between the treating agent and textile material.

4,351,077

CLEANING APPARATUS FOR SUBMERGED SURFACES

Helmut J. Hofmann, 79 Juta St., Braamfontein, Johannesburg, Transvaal Province, South Africa

Filed Dec. 18, 1980, Ser. No. 217,604

Claims priority, application South Africa, Dec. 18, 1979, 79/6583

Int. Cl.³ E04H *3/20*

U.S. Cl. 15—1.7 **5 Claims**

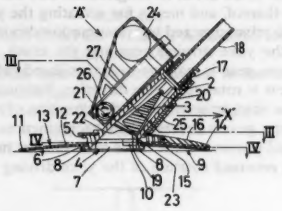
1. An apparatus for cleaning submerged surfaces, such as the bottoms and walls of swimming pools, comprising:

(a) a suction head (1) having an inlet and an outlet (2),

(b) an oscillatory flapper valve (3) disposed within the suction head between the inlet and outlet,

(c) an annular flexible disc (11) mounted proximate the inlet of the suction head,

(d) the inlet being defined by a central opening (7) disposed below the disc and at least one transverse opening (10) disposed above and adjacent the disc, the transverse opening being substantially symmetrical about a direction of movement (X) of the suction head and facing in the general direction of such movement,



(e) a substantially sector-shaped upper member (16) disposed above the transverse opening and extending over a substantial portion of the disc, and

(f) means (14) supporting the upper member in a spaced relationship relative to the disc, whereby liquid and dirt dislodged by the apparatus is guided and funnelled by and between the disc and upper member towards the transverse opening.

4,351,078

DRIVING ARRANGEMENTS FOR FLOOR MAINTENANCE MACHINES

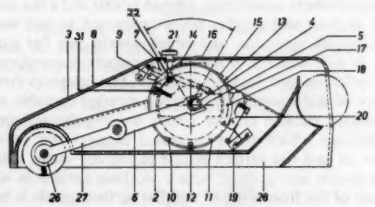
Kurt Sternberg, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Apr. 29, 1981, Ser. No. 258,754

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017072

Int. Cl.³ A47L *5/26, 11/14*

U.S. Cl. 15—49 C **12 Claims**



1. In a machine for treating surfaces, especially in a floor maintenance machine, a combination comprising a machine housing; means for supporting said machine housing in a predetermined position on the respective surface to be treated for displacement along the same; a treating tool; means for mounting said treating tool on said machine housing for treating movement and for positional adjustment toward and away from the respective surface as considered in said position of said machine housing; means for causing said treating tool to conduct said treating movement, including a motor having an output shaft rotatable about an axis, a motor housing mounted on said machine housing for angular displacement about said axis, and a transmission interposed between said output shaft and said treating tool; and means for adjusting the position of said treating tool relative to the respective surface, including a connecting element so connected to said motor housing as to orbit around said axis in dependence on the extent of said angular displacement of said motor housing during the operation of the machine and operatively connected to said mounting means for said treating tool for adjusting the position thereof.

4,351,079

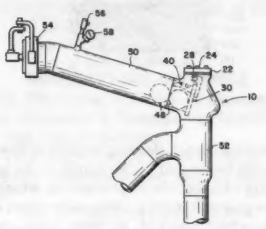
SPHERE LAUNCHING AND RECEIVING VALVE

John R. Fitzpatrick, Tulsa, Okla., assignor to Fitzpatrick Associates, Inc., Tulsa, Okla.

Filed Jun. 8, 1979, Ser. No. 46,863

Int. Cl.³ B08B *9/04*

U.S. Cl. 15—104.06 A **6 Claims**



1. Sphere launching and receiving valve comprising a valve body of substantially L-shaped configuration and having a first port and a second port in communication with the interior of the valve body, an access port in communication with the interior of the valve body, a removable cover member secured to said access port, a valve seat provided within the valve body in the proximity of one of said ports, valve closure means pivotally secured within said valve body and selectively engageable with the valve seat to provide open and closed positions for the valve, recess means provided in said valve body for receiving the closure means therein during an open position of the valve whereby an unrestricted passageway is provided between the first and second ports, one of said ports being an inlet port and the other of said ports being an outlet port during a sphere launching operation, and the ports providing a reverse function during a sphere receiving operation, and wherein a sphere receiving area is provided in the valve body in the closed position of the closure means, and including blocking bar means secured in the valve body in the proximity of the outer surface of said closure means during a sphere receiving operation to preclude accidental entry of a sphere into the sphere receiving area during a closed position of the valve.

4,351,080

TOOTHBRUSH WITH CURVED BRISTLES AND HANDLE

Milton Grossman, 206 Channel Dr., Monmouth Beach, N.J. 07750

Filed Jun. 30, 1980, Ser. No. 163,987

Int. Cl.³ A46B *9/04*

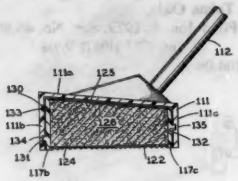
U.S. Cl. 15—167 R **4 Claims**

1. A toothbrush comprising a handle and brush head having bristles extending therefrom wherein said bristles are curved away from a longitudinal axis through said handle and said brush head, with the bristles near the front of the toothbrush distant from the handle end displaced a greater distance from the longitudinal axis then the bristles near the back end of the toothbrush near the handle.

4,351,081
ABSORBENT PAD AND HOLDER ASSEMBLY FOR CARPET CLEANING

Kevork W. Tarkinson, Boynton Beach, Fla., assignor to Ann W. Tarkinson, Boynton Beach, Fla.

Filed Apr. 10, 1981, Ser. No. 252,954
Int. Cl.[3] A47L 11/283, 13/10
U.S. Cl. 15—210 R 13 Claims



1. For use with a carpet cleaning apparatus having a handle and a head at the lower end of the handle to be guided across the carpet being cleaned, the improvement which comprises:

an absorbent pad unit having a thin outer sheet of fiber-reinforced absorbent material, an inner sheet, and a core of soft absorbent material sandwiched between said outer and inner sheets for soaking up moisture passing through said outer sheet;

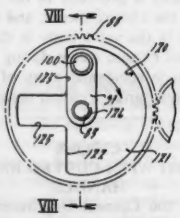
a coarse mesh screen covering said outer sheet of said absorbent pad unit;

and means for mounting said absorbent pad unit and screen on said head of the carpet cleaning apparatus to position said screen in rubbing engagement with the carpet.

4,351,082
OSCILLATING SOOT BLOWER MECHANISM

Dean C. Ackerman, and Don W. Smith, both of Lancaster, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 20, 1981, Ser. No. 255,371
Int. Cl.[3] F23J 3/02
U.S. Cl. 15—316 R 5 Claims

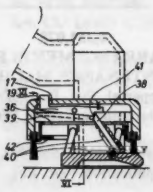


1. In a long travel soot blower or the like having a supporting beam, a carriage adapted to travel along the beam and including a housing forming an enclosure for the carriage, a lance secured to the carriage to travel therewith but rotatable about its longitudinal axis, longitudinal rack means carried by the beam, a motor operatively interconnected with the carriage, walking pinion means carried by the carriage and rotatable to drive the carriage and lance along the beam, transmission means for rotating the walking pinion means and for oscillating the lance about its longitudinal axis including a pair of interfitted independently rotatable shafts journaled in but projecting at their outer ends outside said housing of the carriage, the radially outer of said shafts being drivable by the motor and having gear means thereon within the carriage housing for driving said walking pinion means to actuate the carriage along the beam, a yoke driving gear on the projecting outer end of said radially outer shaft, the outer end of the radially inner shaft extending beyond the outer end of the radially outer shaft, an inner end of said radially inner shaft having a rotary driving connection to the lance within the carriage housing, a yoke driven gear on the outer end of the radially inner shaft, an accessory housing secured to the outside of the carriage housing and enclosing said two last-mentioned gears, a Scotch yoke in said accessory housing for oscillating the yoke driven gear and the radially inner shaft to oscillate the lance about its longitudinal axis during longitudinal travel thereof, and means for actuating the yoke comprising a crank, characterized by a lost motion driving connection between the yoke driving gear and the crank, whereby the yoke driven gear is continuously oscillated while the yoke driving gear is rotating in one direction, but oscillation of the driven gear is interrupted when the direction of rotation of the yoke driving gear is reversed, and recommences at a different longitudinal position of the lance after the lost motion is taken up during reversed rotation of the yoke driving gear.

4,351,083
VACUUM CLEANING NOZZLE

Sven B. Simonsson, Tyreso, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation-in-part of Ser. No. 11,414, Feb. 12, 1979, abandoned. This application Oct. 28, 1980, Ser. No. 201,525
Claims priority, application Sweden, Feb. 15, 1978, 7801751
Int. Cl.[3] A47L 9/06
U.S. Cl. 15—373 8 Claims



1. A vacuum cleaner nozzle provided with a housing adapted to be connected to a source of suction comprising two working members constituting a brush nozzle and a flat surface nozzle, each of said nozzles being connected to said suction source, means mounting said brush nozzle and flat surface nozzle in said housing, a movable member mounted on the upper surface of said flat surface nozzle, two openings through a surface of said housing, an actuating member operable externally of said vacuum cleaner nozzle housing through one of said openings which when depressed engages said movable member on said flat surface nozzle to thereby move said flat surface nozzle into contact with a working surface in which the plane of the front edge of said flat surface nozzle is below the plane of the front edge of said brush nozzle, as viewed in the working direction, said actuating member moving said flat surface nozzle from a non-working condition to a working condition when said actuating member is depressed, a blocking means positioned through said other opening and having an elongated lever part extending within said housing adjacent to the top thereof and having a free end with a notch therein, said blocking means when operative locking said flat surface nozzle into contact with said working surface, a first spring mounted at one end at the free end of said lever part and at the other end on the undersurface of the top of said vacuum cleaner nozzle housing, said brush nozzle being provided with a relatively large opening, a spring-loaded elongated tongue pivotally mounted on one end on said flat surface nozzle and being biased away from said flat surface nozzle and passing through said relatively large opening while the free end thereof engages the notch in said lever part when said flat surface nozzle is moved into contact with said working surface, a second spring mounted at one end of said flat surface nozzle and at the other

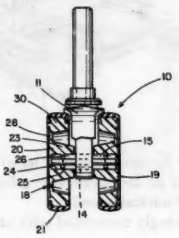
end on the undersurface of said top of the vacuum cleaner nozzle housing to bias said flat surface nozzle in an upper position in said brush nozzle, and said blocking means being depressed to thereby disengage the free end of said tongue from the notch on said lever part in order to return the flat surface nozzle to its non-working position by pivoting said tongue under spring force to effect said disengagement, and said flat surface nozzle is moved by said second spring to its non-working position.

4,351,084

SOFT TREAD CASTER WHEEL AND METHOD OF MAKING SAME

Frank J. Fontana, Stratford, Colo., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Oct. 22, 1979, Ser. No. 86,819
Int. Cl.³ A47B 91/00
U.S. Cl. 16—45 **14 Claims**



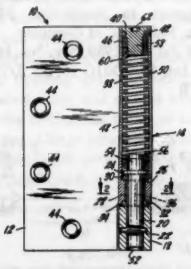
1. A caster wheel having a relatively soft tread surface comprising; a relatively rigid wheel member having a hub adapted to receive an axle, a plurality of annularly spaced outwardly extending projections positioned about the periphery of the hub, each of said projections having at least one axially extending recess therein, and a molded relatively soft tread surrounding the periphery of the wheel and extending the projections and into the recesses to fix the tread to the wheel.

4,351,085

NON-HANDED TWO KNUCKLE HINGE

Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed May 15, 1978, Ser. No. 905,778
Int. Cl.³ E05D 7/02; E05F 1/12
U.S. Cl. 16—273 **30 Claims**



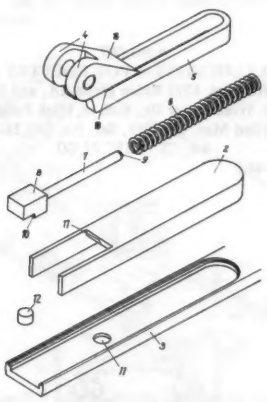
14. A non-handed two knuckle hinge comprising upper and lower axially aligned hinge knuckles formed respectively on adjacent edges of two hinge leaves, an axially extending bore in each said knuckle, attachment means for the leaves adapted to be used to attach them to a door and a jamb, one of the hinge leaves adapted to be attached to either of said door or jamb and the other of said hinge leaves adapted to be attached to the other of said door or jamb; a pintle, about which one of said hinge knuckles pivots, supported in the other of said hinge knuckles against axial movement; first bearing means formed between the hinge knuckles for acting as an axial thrust bearing in a direction of said one knuckle toward said other knuckle when a door is attached to the leaf associated with said upper hinge knuckle; and second bearing means formed in the bore of said one hinge knuckle for acting as an axial thrust bearing in a direction, opposite to said first bearing means, of said one knuckle away from said other knuckle when a door is attached to the leaf associated with said lower hinge knuckle, whereby said hinge may be used interchangeably in left-handed and right-handed door installations and inverted in either type of installation without affecting the operation of the hinge.

4,351,086

BIASED EYEGLASS HINGE

Günther Drlik, Pforzheim, Fed. Rep. of Germany, assignor to OBE-Werk Ohnmacht & Baumgartner GmbH & Co. K.G., Ispringen, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,037
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940055
Int. Cl.³ G02C 5/22; E05D 7/06
U.S. Cl. 16—228 **3 Claims**



1. In a spring hinge for use in an eyeglass frame having a frame center part and two bows, each of which having an inner end comprising a metal portion,

said spring hinge comprising,

a sub-assembly including a receptacle having an open end and adapted to be secured to one of said bows at said inner end thereof,

a first hinge member having an end portion extending into said receptacle,

a plunger rigid with said first hinge member and extending into said receptacle,

spring means urging said plunger into said receptacle, and

a second hinge member pivoted to said first hinge member and secured to said frame center part,

the improvement comprising,

said receptacle comprising a flat box embedded in said bow and secured to said metal portion so that said open end of said receptacle is disposed near said inner end of said bow,

said plunger comprising a U-shaped slider, which has a bight disposed in said receptacle and two legs axially guided in and extending out of said receptacle,

a rod disposed in said receptacle and extending between the legs of said slider,

a spring retainer disposed in said receptacle near the open

end thereof, between the legs of said slider, and axially rigid with said rod, and axially fixed to said metal portion,

said spring means comprising a coil spring, surrounding said rod, and disposed between the legs of said slider, and retained between said spring retainer and said bight, and urging said slider into said receptacle toward a position in which said rod is clear of said bight,

said slider movable into said receptacle against the force of said coil spring until rod engages said bight,

said first hinge member secured to said legs of said slider outside said receptacle, and comprising an overlapping portion which overlaps said receptacle on the outside thereof adjacent to said open end, and

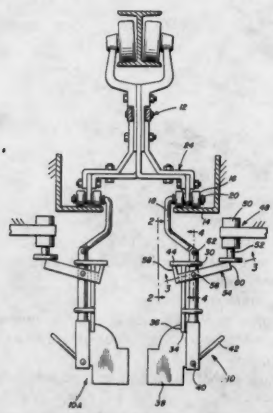
said first hinge member formed with a bevelled surface disposed outside said receptacle, between said overlapping portion and said slider, and facing said open end of said receptacle, whereby, when said hinge is retracted, said bevelled surface engages the outlet edge of said receptacle, at said open end thereof, so that there is no backlash during the movement of said bow from the inturned position to the normal open position.

4,351,087

LATCH RELEASE SYSTEM FOR POULTRY CARRIERS

William F. Altenpohl, 1315 Robin Hood Rd., and Paul J. Altenpohl, 704 N. Westchester Dr., both of, High Point, N.C. 27260

Filed Mar. 18, 1981, Ser. No. 245,214
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—44.1 **10 Claims**



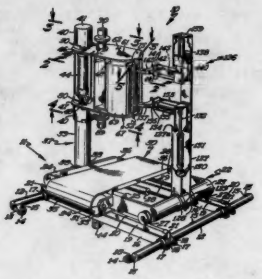
1. In combination with an article carrier having an elongated body pivotally suspended from a moving conveyor, a hook pivotally connected to the body adjacent a lower end thereof, and latch means slidable externally on the body for holding the hook in a latched position projecting laterally from the body in one direction, latch release means engageable with the latch means for exerting an upward latch releasing force thereon, comprising a force transmitting element connected to the body in spaced relation to the hook and engageable with the latch means in laterally spaced relation to the body, and signal controlled power means engageable with the element for exerting a downward operating force on the element laterally spaced from the body opposite the latch means.

4,351,088

METHOD AND APPARATUS FOR REMOVING SKIN FROM ANIMAL CARCASSES

Lyndon R. Leining; Nathan A. Fischer; Kent L. Simonson; Gordon G. White, and Oscar H. Lindstrom, all of Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.

Continuation-in-part of Ser. No. 887,728, Mar. 17, 1978, abandoned. This application May 29, 1979, Ser. No. 43,041
Int. Cl.³ A22B *5/16*; A22C *17/12*
U.S. Cl. 17—50 **17 Claims**



1. An apparatus for removing the torso portion of the skin from the carcass of an animal such as a hog, comprising:

a revolvable cylindrical drum,

drive means drivingly connected with said drum for revolving the same,

a skinning blade positioned in close proximity to said drum,

a flap forming blade on said drum making a longitudinal cut in the torso portion of the skin of the carcass when the carcass is urged against said drum, gripping means on said drum engaging a longitudinal cut edge of the skin pulling a portion of the skin against the flap forming blade to form and grip the flap of the skin, whereby when said drum is revolved, the skinning blade will progressively remove the torso portion of the skin from the carcass,

and shiftable carcass engaging means being shiftable towards and away from said drum, said carcass engaging means when shifted towards said drum and holding the carcass against the gripping means until a skin flap is gripped by the latter.

4,351,089

NEEDLE BAR DRAW FRAME

Joachim Jahnke, Lübeck; Günther Lehming, Pogeez; Helmut Kunig, Hamburg, and Jens Nagel, Mölln, all of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader, Lübeck, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,923
Int. Cl.³ D01G *19/00, 5/14*
U.S. Cl. 19—129 R **5 Claims**

1. Needle bar draw frame or gill box for slivers comprising needle field or gill area means of needle bars carried by chains for continuous uninterrupted movement and having spaced upstanding needles, entry roller means lying upstream of said needle field means, drawing roller means disposed downstream of said needle field means and controlling means for said slivers

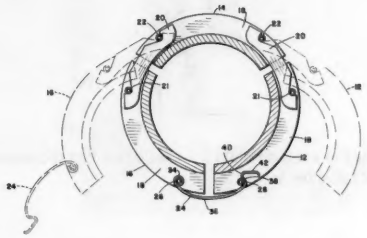
arranged above said needle field means and dipping in between the needles of said needle bars, wherein said controlling means includes at least one holding down device provided with a plurality of depending resiliently yielding bristles and mounted in a stationary position above said needle field means with said bristles projecting between said needles and being inclined in the direction of motion of said needle field means.

4,351,090

SPRING CLIP FOR WELLHEAD SLIPS

Gary B. Clements, Bixby, and Robert E. Ramsey, Owasso, both of Okla., assignors to Hinderliter Energy Equipment Corp., Tulsa, Okla.

Filed Oct. 31, 1980, Ser. No. 202,635
Int. Cl.³ E21B *43/00, 3/00*
U.S. Cl. 24—263 D **2 Claims**



1. A wellhead slip formed from a plurality of slip segments adapted to be arranged in a closed circular fashion around a tubular member so as to form a plurality of vertical gaps all but one of which are defined as hinge gaps, the remaining gap being defined as an opening gap, said slip segments being provided with aligned circumferential grooves consituting, in effect, a peripheral groove for the slip, a hinge yoke received in the circumferential grooves in the area of each hinge gap and spanning said hinge gap, each hinge yoke being provided with a notch adjacent each of its opposite ends and facing outwardly from said groove, a hinge pin passing through holes above and below said groove in the area of each notch whereby the notches are received inwardly behind said hinge pins and whereby all of the slip segments can be moved hingedly outwardly from the closed circular position by opening at the opening gap, an elongated spring clip received in the ends of the circumferential grooves of the adjacent segments in the area of the opening gap and having a vertical width slightly less than the width of the grooves, a pair of latch pins received in holes above and below said groove in said slip segments on opposite sides of said opening gap, said spring clip having a closed loop adapted to be received around one of said latch pins adjacent said opening gap and being provided with a resilient catch spaced from said closed loop for engagement around and inwardly behind the other of said latch pins adjacent said opening gap, a finge attached to said resilient catch to permit bending of said catch away from said other of said latch pins for releasing said catch to permit opening of said slip segments.

4,351,091

METHOD OF PRESERVING CORPSES

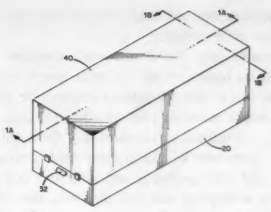
Richard P. Goodkin, 336 Singletary La., Framingham, Mass. 01701

Filed Jul. 21, 1980, Ser. No. 170,958
Int. Cl.³ A01N *1/00*
U.S. Cl. 27—22 R **13 Claims**

1. A method of preserving anatomical specimens including:

A. encasing the specimen in an air-tight container;

B. exchanging the atmospheric contents within the container surrounding the specimen with an inert gas; and



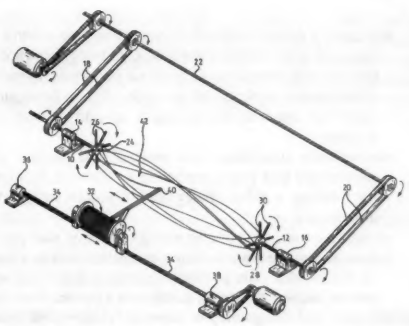
C. irradiating the specimen to destroy bacteria and microorganisms.

4,351,092

METHOD OF FABRICATION OF CORELESS HOLLOW FILAMENT SEPARATORY MODULE

Robert E. Sebring, Westwood, and Myron J. Coplan, Natick, both of Mass., assignors to Albany International Corp., Menands, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,747
Int. Cl.³ B01D *13/04;* B65H *54/64*
U.S. Cl. 28—100 **3 Claims**



1. The method of fabricating a coreless holow filament bundle of interlaced hollow filaments to be used as the membrane elements in a separatory module comprising the steps of providing first and second axially spaced co-axially rotatable engagement members carrying filament receiving arms, concomitantly rotating said rotatable engagement members while alternately engaging filaments upon a respective filament receiving arm of one rotary member, causing said filament to traverse the space between said first rotary member and the second rotary member and engaging said filament upon a receiving arm of said second rotary member, and continuously feeding said filament between said receiving arms of said rotary membrs so as to provide a coreless bundle of filaments interlacing with one another in left and right hand helices at angles to the common axis of rotation of the two rotary members.

4,351,093

METHOD OF MAKING MODULAR YARNCRAFT

Bella Scharf, 7813 20th Ave., Brooklyn, N.Y. 11214

Filed Apr. 27, 1979, Ser. No. 33,993
Int. Cl.³ D04D *7/02*
U.S. Cl. 28—149 **4 Claims**

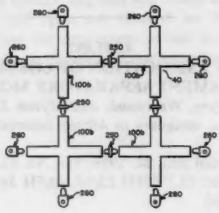
1. A method of creating an expandable Ojo-like wrapped fiber design comprising the steps of:

providing a first preformed central section having at least three pole portions extending radially outward from said provided central section and being disposed about said central section;

providing at least one mateable framework member having at least one pole member;

mateably connecting the framework member at its pole member to at least one of said pole portions of said first central section so as to provide a connection zone between the framework member and an adjacent pole portion for providing a continuous substantially flush modularly expandable framework comprising said framework pole member, said pole portions and said first central section;

continuously wrapping yarn around said modular substantially flush expandable framework in an Ojo-like arrangement;



providing a second preformed central section having a plurality of pole portions extending radially outward from said second central section at the periphery thereof, the cross-section thickness of said pole portions being substantially the same as the thickness of said second central section;

continuously wrapping yarn around said second central section and said pole portions in an Ojo-like arrangement for creating a substantially flush Ojo-like wrapped fiber design; and

mateably connecting one free end of one of said pole portions extending from said first central section to a free end of one of said pole portions extending from said second central section to form a composite Ojo-like fiber design;

whereby said design may be modularly expanded by modularly enlarging said framework to be continuously wrapped.

4,351,094

METHOD OF MANUFACTURING A SABOT PROJECTILE AND SABOT PROJECTILE PRODUCED THEREBY

Peter Häberli, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jul. 23, 1979, Ser. No. 60,050

Claims priority, application Switzerland, Aug. 8, 1978, 8404/78

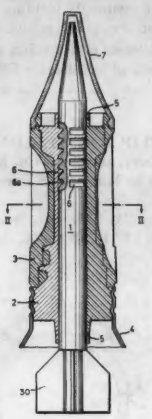
Int. Cl.³ B21K *21/06*

U.S. Cl. 29—1.2 **4 Claims**

1. A method of manufacturing a sabot projectile, especially an arrow projectile, containing a metallic projectile body, a sabot formed of a metal alloy and a plastic jacket, comprising the steps of:

directly molding, in a first mold, the metallic sabot at the metallic projectile body in a manner such that the metallic sabot is divided into segments by gaps;

forming holder means during molding of the metallic sabot at the metallic projectile body; and



molding in a second mold the plastic jacket at the projectile body and the sabot.

4,351,095

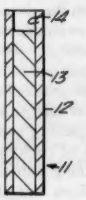
METHOD OF MAKING SPARK PLUGS

Michael J. Davies, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 859,396, Dec. 12, 1977, abandoned. This application Jun. 6, 1979, Ser. No. 45,974

Int. Cl.³ H01T *13/00*

U.S. Cl. 29—25.12 **12 Claims**



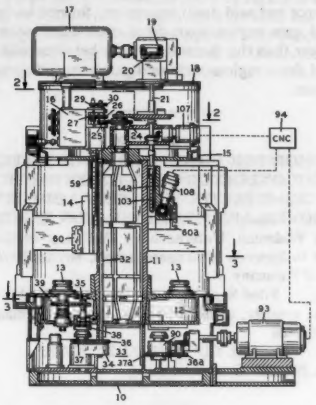
1. A method of manufacturing an electrode for a spark plug comprising the steps of, providing a tubular outer metal sheath, locating a core of thermally conductive metal coaxially in the bore of the sheath, working the sheath down onto the core, removing the core from a region at one end of the sheath to form a projecting sheath portion, holding the sheath substantially vertically with said one end of the sheath uppermost, melting over the projecting sheath portion at said region to form therefrom a molten pool of sheath metal over the end of the core and provide metal to metal contact between the molten pool, the core, and the outer sheath, and allowing the molten pool to cool and solidify and thereby provide a seal of sheath metal over the entire end of the core in contact therewith and fused to the outer sheath.

4,351,096

MULTIPLE SPINDLE ROTARY INDEXING MACHINE TOOL

Frank A. Depweg, Fairfield, and Edward A. Zukowski, Milford, both of Conn., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 28, 1980, Ser. No. 182,212
Int. Cl.³ B23B *13/04, 9/12*
U.S. Cl. 29—38 A 5 Claims



1. A multiple spindle, rotary indexing machine tool having a base, a central column upstanding from said base, a load-unload station, a plurality of machining stations each with a tool slide, a rotary worktable on said base and surrounding said column, work carrying spindles on said worktable at spaced work positions, and means for indexing said worktable to advance said work carrying spindles successively from the load-unload station through each of the machining stations in sequence and back to the load-unload station, characterized by

(a) a single primary drive motor,

(b) controllably engageable spindle drive mechanisms in said base at each of the machining stations,

(c) first sets of independent, changeable gear mechanisms for connecting said primary drive motor to the spindle drive mechanisms at each machining station except the final finish machining station,

(d) second sets of independent, changeable gear mechanisms for connecting said primary drive motor to each of the tool slides at the several machining stations having gear-connected spindle drives,

(e) independent X and Y axis positioning motors connected for moving the tool slide at said final machining station,

(f) an independent spindle drive motor connected for moving the spindle at said final machining station, and

(g) a CNC control unit coordinating the operations of said positioning motors and of said independent spindle drive motor.

4,351,097

HYDRAULIC PLIERS FOR SNAP RINGS

Seiichi Hashimoto, 51,4-Chome, Nagata-Higashi, Higashi-Osaka-Shi, Osaka-Fu, and Takaaki Aoki, Tamaebashi-Bldg., 3-36, 4-Chome, Nakanoshima, Kita-Ku, Osaka-Shi, both of Japan

Filed Jun. 24, 1980, Ser. No. 162,441
Claims priority, application Japan, Mar. 24, 1980, 55/37271
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—229 8 Claims

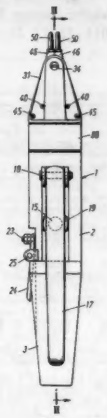
1. Hydraulic pliers for snap rings having ends comprising:

a hand-holdable main body having an end and a longitudinal axis;

hydraulic pump means housed in the main body including a piston extendable along the axis towards the end of the main body;

a cam head on the piston extending beyond the end of the main body;

a plier head on the end of the main body, the cam head being extendable into a bore in the plier head, and



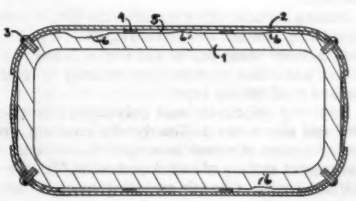
a pair of parallelogram link means pivotally, symmetrically mounted on the plier head and coacting with the cam head for linearly moving engaged ends of a snap ring without axial movement of the main body, each link means including a straight working-pin for engagement with the ends of the snap ring.

4,351,098

METHOD FOR REPAIRING AND REINFORCING CAST IRON MOLDS

Glenn W. Hanna, 1441 Wightman St., Pittsburgh, Pa. 15217

Filed Jun. 11, 1980, Ser. No. 158,409
Int. Cl.³ B23P *6/00*
U.S. Cl. 29—402.15 10 Claims



1. A method for reinforcing and repairing cast iron molds, wherein a continuous band is used which is elevated from the mold wall by spacers to reduce heat conduction, which comprises:

(a) surrounding the mold with at least one closely fitted steel plate;

(b) connecting the ends of the steel plate or plates to form a continuous band;

(c) attaching the continuous band to the cast iron mold;

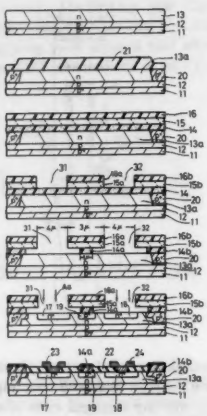
(d) locating a plurality of spacers on each face of the mold between the cast iron mold and the continuous band so as to elevate the band from the cast iron mold wall, limiting the transfer of heat to said band when the mold is heated, thereby preventing the plastic deformation of the band.

4,351,099

METHOD OF MAKING FET UTILIZING SHADOW MASKING AND DIFFUSION FROM A DOPED OXIDE

Hiromitsu Takagi, Shiga; Shotaro Umebachi, Kyoto; Gota Kano, Nagaokakyo, and Iwao Teramoto, Ibaraki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed May 12, 1980, Ser. No. 149,621
Claims priority, application Japan, May 18, 1979, 54-61857
Int. Cl.[3] H01L *21/31, 21/265, 21/225*
U.S. Cl. 29—571 6 Claims



1. A method of making a field effect transistor comprising the steps of:

(a) forming a semiconductor layer of a first conductivity type to become a channel region on a semiconductor substrate of a second conductivity type opposite to said first conductivity type,

(b) forming selectively an isolation region of said second conductivity type in said semiconductor layer in a manner that the selectively formed isolation region penetrates into said semiconductor layer, reaching the surface of said semiconductor substrate and forming an isolated island region of said first conductivity type in said semiconductor layer,

(c) forming successively a doped oxide film, a polycrystalline silicon film and a silicon nitride film on the surfaces of said isolated island region and said isolation region, said doped oxide film containing an impurity to result in said second conductivity type,

(d) removing selectively said poly-crystalline silicon film and said silicon nitride film thereby retaining a predetermined pattern of a mask to be used as an etching mask for subsequent etching of said doped oxide film, the retained pattern having a length extending to a part above said isolation region,

(e) etching and side-etching said doped oxide film by use of the retained pattern as said etching mask thereby exposing the surface of said isolated island region at parts which are not covered by said etching mask and which surround said etching mask so that said doped oxide film becomes narrower than a width of said etching mask and has a length extending to reach above said isolation region,

(f) ion-implanting another impurity of said first conductivity type into said isolated island region by use of said etching mask as an implantation mask,

(g) carrying out a heat treatment to diffuse said second conductivity type impurity from said doped oxide film retained narrowed by said side-etching under said etching mask into a region to become said channel region in said isolated island region thereby to form a gate region, and also to drive said ion-implanted another impurity into said isolated island region thereby to respectively form a source region and a drain region on both sides of said etching mask,

(h) removing said etching mask followed by forming an oxide layer over the entire surface of said semiconductor layer,

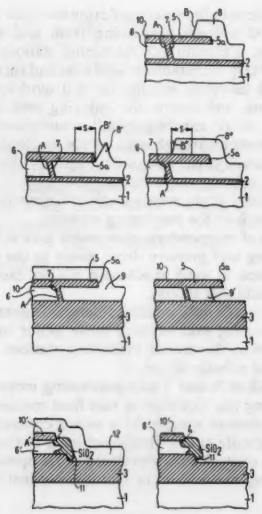
(i) forming a source and a drain electrode at least at openings partly formed above said source and said drain regions, respectively, in such a manner that the openings for said source and said drain regions are formed on both sides of said gate region apart from each other with a distance larger than the shortest distance between said source and said drain regions with said gate region disposed therebetween.

4,351,100

METHOD FOR MANUFACTURE OF INTEGRATED SEMICONDUCTOR CIRCUITS, IN PARTICULAR CCD-CIRCUITS, WITH SELF-ADJUSTING, NONOVERLAPPING POLYSILICON ELECTRODES

Dietrich Widmann, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,774
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939488
Int. Cl.[3] H01L *21/20, 21/283*
U.S. Cl. 29—577 C 1 Claim



1. In a method for manufacturing self-adjusted nonoverlapping polysilicon electrodes (poly-Si-1 and poly-Si-2) in integrated CCD semiconductor circuits wherein a polysilicon-1-electrode (6) is first formed with a masking layer thereon of SiO_2 or Si_3N_4, said method further comprising:

(a) etching the polysilicon-1-electrode (6) during the presence of said masking layer (5, 10) of SiO_2 or Si_3N_4 in covering relation thereto,

(b) carrying out the etching of the polysilicon-1-electrode (6) to such degree that lateral underetching occurs at an edge (5*a*) of the masking layer (5, 10) covering the polysilicon-1-electrode (6) to form an overhang (5) of the masking layer (10) with an edge (5*a*) of the overhang (5) of the

masking layer (10) having a spacing from the edge (A) of the etched polysilicon-1-electrode (6) corresponding to twice the amount of a maximally occurring edge position error (±s) which can arise in the superposition of a polysilicon-2-electrode with an edge (B) onto the polysilicon-1-electrode,

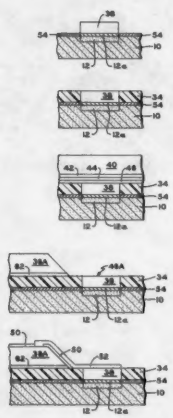
(c) carrying out a thermal oxidation step whereby the edge (A) of the polysilicon-1-electrode is covered with an SiO_2 layer (7), and

(d) applying a second polysilicon layer by means of a chemical vapor deposition step known per se, with the use of a mask, to generate the non-overlapping polysilicon-2-electrode (8) at a level above the level of the overhang (5) while also filling the hollow below the overhang with silicon.

4,351,101
SEMICONDUCTOR DEVICE PROCESSING FOR READILY AND RELIABLY FORMING ELECTRICAL INTERCONNECTS TO CONTACT PADS

Miriam F. Young, Dorchester, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 198,319
Int. Cl.³ H01L *21/95*
U.S. Cl. 29—577 C **8 Claims**



1. An improved method of providing a semiconductor device having a semiconductor substrate containing solid state signal processing circuitry, the solid state signal processing circuitry comprising doped regions of predetermined resistivity within the semiconductor substrate, there being a passivation layer covering a surface of the semiconductor substrate but with electrical contacts to the solid state signal processing circuitry exposed through the passivation layer, the improvement comprising:

forming, on the electrical contacts, contact pads which have an upper surface devoid of a depressed center region, the contact pads extending above the passivation layer, there being free space between the contact pads above the passivation layer;

after the forming step, depositing an adhering insulator material of the type which is applied in substantially uncured form, the substantially uncured adhering insulator material being deposited so that the substantially uncured adhering insulator material substantially covers the contact pads and substantially fills the free space between the contact pads above the passivation layer;

mounting a semiconductor wafer onto the substrate above the contact pads to form an assembly;

applying pressure and heat to the assembly so that, prior to curing, adhering insulator material is squeezed out between the contact pads and a minimum thickness of adhering insulator material remains between the upper surface of the contact pads and the wafer;

allowing the adhering insulator material to cure;

removing portions of the wafer and adhering insulator material to expose the upper surface of predetermined contact pads; and

electrically interconnecting predetermined regions of the remaining semiconductor wafer with predetermined contact pads.

4,351,102
METHOD FOR WINDING THE STATOR IN A THREE PHASE AC MACHINE

Alfred Grozinger, Stuttgart; Manfred Frister, and Helmut Kreuzer, both of Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,913
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750112
Int. Cl.³ H02K *15/085*
U.S. Cl. 29—596 **7 Claims**

1. A method for winding a first, second and third winding each having a winding start on a stator to constitute the first, second and third phase of a three phase AC machine said three phase AC machine having a plurality of poles and a stator having a predetermined number n grooves per pole and phase, said method comprising the combination of steps of

winding said first winding starting at a first groove and ending at a corresponding first end groove and creating a first winding end in operative proximity of said first end groove;

winding said second winding starting at a second groove adjacent to said first groove and ending at a second end groove adjacent to said first end groove, and creating a second winding end in operative proximity of said second end groove;

winding said third winding starting at a third groove adjacent to said second groove and ending at a third end groove adjacent to said second end groove, and creating a third windend in operative proximity of said third end groove, adjacent grooves being spaced from each other by a number of grooves equal to n; and

the step of electrically connecting either said start of said first and third winding to said second winding end or said first and third winding end to said start of said second winding to provide the star point of a Y-connected combined winding.

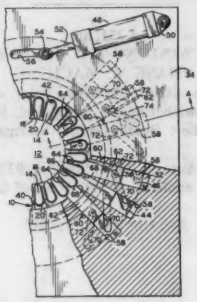
4,351,103
METHOD AND APPARATUS FOR SUPPORTING SLOT LINER CUFFS DURING COIL INSERTION

Philip G. Rodenbeck, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jul. 28, 1980, Ser. No. 173,053
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—596 **4 Claims**

1. A method of inserting prewound coils of wire in the slots of a stator assembly including a core having two opposite faces and a plurality of slots extending through the core from one face to the other, and the stator assembly including slot liners in the slots of the core wherein the liners are longer than the slots and include cuffs which protrude beyond the faces of the

core, the method comprising: placing the stator in a stator holder having a plurality of cuff supports arranged about a centrally disposed opening, so that the stator bore is aligned with such opening, and so that the plurality of cuff supports are in abutment with one of the faces of the core; moving the cuff supports adjacent to and in close proximity to the cuffs of at least some of the slot liners; relatively moving the stator holder and stator carried thereby with respect to coil injection tooling



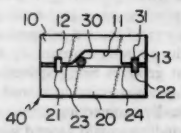
having previously wound wire coils supported thereon, and thereby interfitting such tooling with the bore of the stator through the centrally disposed stator holder opening; and pulling the coils of wire through the stator holder opening and into the slots of the stator core, over the cuffs of the liners and over the cuff supports, the coils contacting and being supported by the cuff supports as they are pulled over the respective cuffs and into the slots.

4,351,104

METHOD FOR MANUFACTURING MAGNETIC HEADS

Kiyoshi Klagane, Funabashi, and Masao Kakizaki, Chiba, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,232
Claims priority, application Japan, Nov. 12, 1979, 54/146206
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 **5 Claims**



1. A method for manufacturing annular portions of magnetic heads composed of two magnetic circuit elements consisting of ferromagnetic material and having confronting gap surfaces with an extremely small gap therebetween filled with nonmagnetic material bonding the circuit elements together, comprising the steps of:

grooving at least one ferromagnetic bodies to form said ferromagnetic circuit elements;

assembling said ferromagnetic circuit elements with each other in such a manner that at least one spacer is selectively located between the confronting gap surfaces so as to leave an effective gap for the magnetic material-filled gap;

placing a nonmagnetic bonding mass selected from the group consisting of glass and enamel in at least one of said grooves, outside of and adjacent to said effective gap;

placing said assembled ferromagnetic circuit elements in a furnace;

heating said assembled ferromagnetic circuit elements to a temperature which causes said nonmagnetic bonding mass to be flowable while applying a centrifugal force to said nonmagnetic bonding mass, thereby causing a forced flow of said nonmagnetic bonding mass into said effective gap;

cooling said heated ferromagnetic members; and;

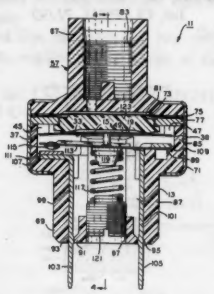
subsequently mechanically cutting the bonded ferromagnetic circuit elements into a number of portions of the magnetic heads having the requisite gap width.

4,351,105

METHOD OF MAKING A CONTROL DEVICE

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 63,703, Aug. 6, 1979, Pat. No. 4,287,780, which is a division of Ser. No. 960,172, Nov. 13, 1978, Pat. No. 4,200,776. This application Apr. 6, 1981, Ser. No. 251,653
Int. Cl.³ H01H *11/00*
U.S. Cl. 29—622 **16 Claims**



1. A method of making a control device having a switch means movable therein between a pair of conductivity modes and also having a snap-action member operable generally from a stable configuration thereof toward an unstable configuration thereof to effect the movement of the switch means from one of its conductivity modes to the other thereof, the method comprising the steps of:

(a) forming the snap-action member in the stable configuration thereof from a metallic material having a directed grain orientation with at least one means for interlocking the snap-action member with the control device being integrally formed with the snap-action member so as to extend generally in the direction of the directed grain orientation in the metallic material of the snap-action member;

(b) providing in the control device at least a pair of means for abutment with the snap-action member only in the unstable configuration thereof and with the abutment means pair generally defining therebetween a channel means extending in a predetermined direction;

(c) mounting the switch means in the control device so that said switch means may be moved from the one conductivity mode to the other thereof when the switch means is operatively associated with the snap-action member;

(d) seating the snap-action member in the control device in operative association with the switch means and engaging the interlocking means on the snap-action member with confronting parts of the control device so as to locate the snap-action member in a preselected assembly in the control device and also generally align the direction of the directed grain orientation of the snap-action member with the predetermined direction of the channel means between the abutment means pair.

4,351,106

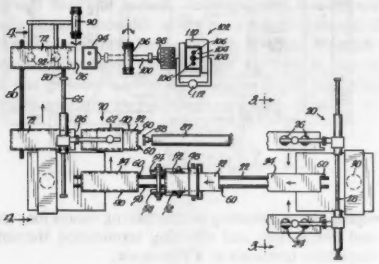
BATTERY CELL ASSEMBLY SYSTEM AND METHOD

Allan O. Brady, 906 Bristol Rd., Yorkville, Ill. 60560

Filed Aug. 20, 1980, Ser. No. 179,649

Int. Cl.³ H01M *10/04*

U.S. Cl. 29—730 **1 Claim**



1. A system for assembling battery cells, comprising means for supplying generally rectangular negative and positive battery plates in alternate succession to a plate packaging station, each plate having a conductive lug extending from a side thereof, said means for supplying negative and positive plates to the packaging station comprising conveyor means and vacuum pickup means for alternately placing negative and positive plates from stacks thereof on said conveyor means for being transported to the packaging station; means at the packaging station for packaging each plate in separator material with the plate lug extending outwardly of the material, said means for packaging comprising means for extending a generally rectangular sheet of thermoplastic separator material across the path of travel of the plate on said conveyor means, so that a leading side edge of the plate engages one side of the sheet centrally thereof and deflects the sheet, folding rolls on an opposite side of the sheet centrally thereof for receiving the sheet and the plate between a nip thereof as the sheet is deflected by the plate and the plate is transported by said conveyor means, and for folding the sheet around the plate, said edge heat seal means along the path of travel of the plate and sheet beyond said folding rolls for heat sealing together the side edges of the separator material which are adjacent the fold to form a pouch of separator material around the plate, the plate being oriented so that the lug thereof extends through an open end of the pouch opposite from the fold, side edge trim means along the path of travel of the plate and sheet beyond said side edge heat seal means for trimming excess material from the side edges of the sheet outwardly of the heat sealed portions, and another side edge heat seal means for sealing the central portion of the open end of the pouch opposite from the fold to secure the plate in the pouch but to enable the plate lug to extend therefrom; means for placing a plurality of the packaged plates side by side in an open ended container to alternate plates of negative and positive polarity and to position the plate lugs toward the open end of the container, said means for placing the packaged plates in an open ended container comprising clamshell pickup means for removing the packaged plates from said conveyor means and for placing the packaged plates in a stack to alternate plates of positive and negative polarity, second conveyor means for transporting the container in horizontal position into alignment with the stack, such that bottom ends of the plates opposite from the lugs are aligned with the open end of the container, and piston means for pushing the stack of plates into the container such that the stack enters the container bottom end first through the open end of the container; means for electrically connecting the lugs of the negative plates in parallel and the lugs of the positive plates in parallel, said means for electrically connecting comprising second vacuum pickup means for transporting the container with battery plates therein to a casting station and, at said casting station, means for casting a first lead conductor across the lugs of all of the negative plates to connect the negative plates in parallel and a second lead conductor across the lugs of all of the positive plates to connect the positive plates in parallel when the plates are in the container, said means for casting including means for casting a pair of conductive lead posts, one each in electrical contact with each of the conductors; and means for placing a closure on the open end of the container to enclose the plates therein, wherein the container and the closure are of a thermoplastic material, and wherein said means for placing a closure on the container includes third vacuum pickup means for transporting the container with battery plates therein from said coating station to a container closing station, and means at said closing station for placing the closure over the open end of the container and for heat sealing the closure thereto, the closure having a pair of passages therethrough and said placing means placing the closure over the open end of the container to extend the posts through respective ones of the passages prior to heat sealing the closure on the container.

4,351,107

APPARATUS FOR COMPRESSING WINDING ELEMENTS IN AN ELECTRIC MACHINE

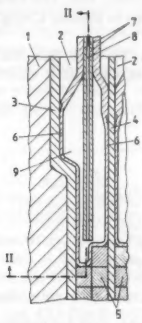
Willy Germann, Wurenlos, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Continuation of Ser. No. 6,127, Jan. 24, 1979, abandoned. This application Sep. 8, 1980, Ser. No. 184,886

Claims priority, application Switzerland, Jan. 25, 1978, 790/78

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—736 **1 Claim**



1. An apparatus for compressing winding elements in slots of the core of an electric machine comprising:

an inflatable elastic, rubber bellows for insertion in a slot of the electric machine; and

a rigid plate formed with at least one conduit leading to the interior of the elastic bellows and fastened to the elastic bellows for supplying a pressurized medium to the interior of the elastic bellows to compress windings in the core as the conductors are built up in the slot and through which the elastic bellows is depressurized for removal from the core.

4,351,108

PACKAGING SYSTEM FOR SEMICONDUCTOR BURN-IN

James E. Johnson, Katy, Tex., assignor to Reliability, Inc., Houston, Tex.

Filed Jul. 7, 1980, Ser. No. 165,969

Int. Cl.³ H05K *13/04*

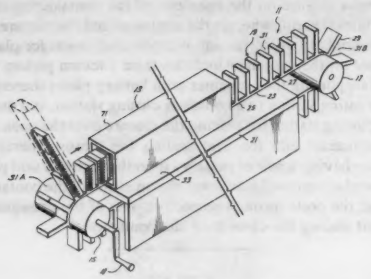
U.S. Cl. 29—741 **16 Claims**

1. A system for temporarily packaging semiconductors comprising:

cartridge means for holding such semiconductors, said car-

tridge means including an elongate chamber and a plurality of electrical conduits within said chamber; and

loading means for sequentially loading such semiconductors into said chamber from one end of said chamber such that



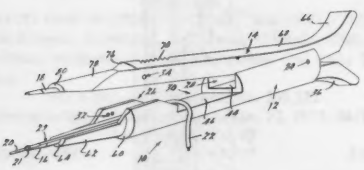
such semiconductors are in electrical communication with said electrical conduits, said holding means being actuated into engagement with such semiconductors upon such semiconductors entering said chamber from said one end.

4,351,109

CONTACT INSERTION/REMOVAL TOOL

William D. Kelly, Orlando, Fla., and Gregory J. Vella, Davisburg, Mich., assignors to Balmar Crimp Tool Corp., Orlando, Fla.

Filed Jun. 20, 1980, Ser. No. 161,276
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—747 **29 Claims**



1. A manually operable tool for handling electrical contacts in connectors, comprising:

a pair of longitudinally extending, generally opposed contact holders for releasably holding a contact or the like; and

means for pivotally and longitudinally slidably attaching one of said holders to the other of said holders, allowing therebetween generally transverse movement for insertion therebetween of a contact or the like and longitudinal movement between an insertion position and a removal position.

4,351,110

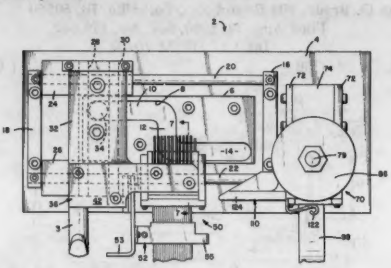
APPARATUS FOR TERMINATING RIBBON CABLE

Kenneth F. Folk, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 3, 1979, Ser. No. 81,409
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 **4 Claims**

1. An apparatus for terminating separated conductors at the free end of a multi-conductor ribbon cable, said apparatus comprising:

a conductor programming station having a pair of opposed comb members having a plurality of interdigitating teeth having means for engaging the conductors of said ribbon cable and driving adjacent conductors into two parallel spaced planes, alternate conductors being driven into the same plane;



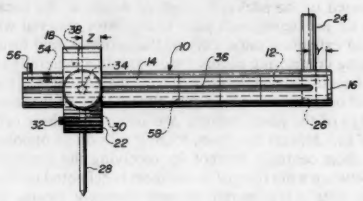
a wiping and terminating station having means for receiving said conductors and effecting termination thereof with respective terminals of a connector.

4,351,111

MACHINE TOOL FOR SCRIBING ARCS AND CIRCLES

John A. Carr, R.D. #5, Box 524, Hanover, Pa. 17331

Filed Mar. 6, 1981, Ser. No. 241,421
Int. Cl.³ B26D *3/08*
U.S. Cl. 30—164.9 **7 Claims**



1. A machine tool for scribing arcs and circles on work pieces comprising in combination, an elongated arm having a smooth outer surface of uniform cross-sectional shape, a perpendicular stud fixed to said arm a short distance inwardly from one end thereof for supporting said arm in a chuck on a rotatable spindle of a machine tool, a slide having a bore closely complementary to the surface of said arm and slidable adjustably therealong, a stylus for scribing work pieces projecting perpendicularly from said slide, means carried by said slide and engageable with said arm to releasably clamp said slide and stylus thereon at a precise distance from the axis of said stud, the width of said slide in a direction parallel to said arm being greater than the diameter of said stud, said arm having a reference flange fixed to the stud end thereof outwardly from said stud and provided with a perpendicular face spaced precisely from the axis of said stud a distance equal to the distance between the face of said slide nearest said stud and the axis of the stylus carried by said slide, whereby guage blocks may be positioned along said arm between said faces of said flange and slide to permit precise radii to be established upon said tool for scribing arcs and circles therewith.

4,351,112

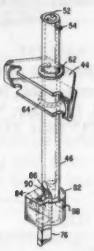
SABRE SAW BAR AND BLADE HOLDER

David J. Nalley, Liberty, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 20, 1981, Ser. No. 236,417
Int. Cl.³ B27B *19/02*
U.S. Cl. 30—392 **8 Claims**

1. In a motorized sabre saw for reciprocating an elongated saw blade, or the like, a saw bar and blade chuck combination wherein an end portion of the saw bar is of generally circular

cylindrical configuration having a longitudinally extending groove therein, said groove having a first wall spaced apart from a radius of the bar a distance substantially equal to one-half the thickness of the blade to be driven thereby and generally parallel such radius, and a second wall generally perpendicular said first wall extending from said first wall across such radius, said first and second walls defining therebetween a generally square shoulder whereby a blade clamped thereagainst will be generally bisected by such radius, together with a clamp block mounted with said saw bar over at least a portion of said groove, said clamp block having a first generally cylindrical aperture therethrough, a major portion of said



aperture being generally circular and complementary to said end portion of said saw bar, the remaining portion of said aperture comprising a generally rectangular groove, one wall of which is disposed in general alignment with said first wall of said saw bar, the opposite wall of said rectangular groove intersecting said second wall of said saw bar generally perpendicular thereto, said one wall and said other wall being spaced apart a distance at least the thickness of the blade shank, together with first and second fastening means, said first fastening means securing said clamp block with said saw bar and said second fastening means replaceably securing a saw blade, or the like, within said aperture.

4,351,113

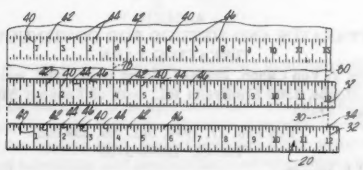
PRESSURE SENSITIVE ADHESIVELY BACKED DISPOSABLE MEASURING TAPE AND METHOD OF MANUFACTURE

Claire C. Eggertsen, and John H. Eggertsen, both of 1308 Greenridge, Rochester, Mich. 48063

Filed Aug. 14, 1978, Ser. No. 933,461

Int. Cl.³ G01B *3/02*

U.S. Cl. 33—137 R **3 Claims**



1. An adhesively backed tape having measurement indicia printed on a non-adhesive surface thereof and being constructed in the form of an elongate strip of fibrous organic material, creped over its entire length to permit highly localized stretching to conform to slight irregularities in a surface to which the tape may be attached, the strip material having a tensile strength of less than about 20 pounds to permit hand tearing, the adhesive backing having an adhesion strength of between 12 ounces and 24 ounces, and the strip being of such length as to repeat the measurement indicia and to permit rolling into a size which is convenient for manual handling.

4,351,114

PROCESS FOR MEASURING USING STANDARD BLOCKS AND A STANDARD MEASURING BLOCK

Hans Sigg, Charmettes 15, CH-2006 Neuchâtel; Robert Viret, 111, Ave. de Morges, CH-1004 Lausanne; Heinz Wegmann, Chemin des Perreuses 6c, CH-2013 Colombier, and Ernst Waser, Riedenstrasse 33, CH-6370 Stans, all of Switzerland

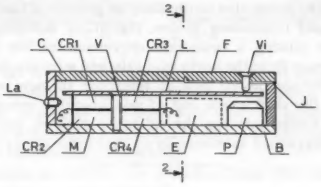
PCT No. PCT/CH78/00046, § 371 Date Aug. 6, 1979, § 102(e) Date Jul. 9, 1979, PCT Pub. No. WO79/00348, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 6, 1978, Ser. No. 130,166

Claims priority, application Switzerland, Dec. 6, 1977, 14883/77

Int. Cl.³ G01B *3/20*

U.S. Cl. 33—174 H **16 Claims**



1. A standard measuring block comprising a parallelepiped, two parallel surfaces of which are set apart at a standard distance, having disposed therein an element maintained in vibration, a detector of the vibrations of the element and at least one signalling means announcing a change in the state of the vibrations caused by contact by an external object on one of said two parallel surfaces said vibrating element being constituted by a plate inside the standard block, said plate coming into contact with a flexible part of said surface contacted by said external object.

4,351,115

APPARATUS FOR CHECKING THE LINEAR DIMENSIONS OF SHAFTS

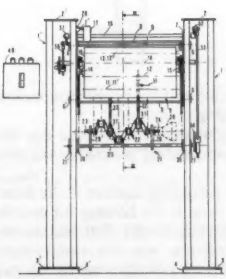
Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs, S.p.A., S. Marino di Bentivoglio, Italy

Filed Mar. 26, 1980, Ser. No. 134,084

Claims priority, application Italy, Apr. 5, 1979, 3368 A/79

Int. Cl.³ G01B *7/12*

U.S. Cl. 33—178 D **15 Claims**



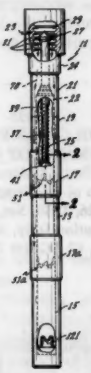
1. An apparatus for checking linear dimensions of shafts, comprising: a frame; centering means connected to the frame to define a horizontal axis for supporting the shaft to be checked; measuring means having a mechanical reference device adapted to contact the shaft, sensing means mounted on said reference device adapted to cooperate with the shaft surface, transducer and detection means associated with the

sensing means to provide signals responsive to the linear dimensions; a supporting device for said measuring means fixed to the frame; connection means for connecting the measuring means to the supporting device; and control means; wherein the connection means include at least a pair of arms and constraint means, a first arm of the pair being rotatable, with respect to the supporting device, along a plane perpendicular to the horizontal axis, and the second arm of the pair being rotatable, with respect to the first arm, along the same plane, the constraint means being adapted to allow the rotations of the arms basically without elastic reactions, the control means including a movable member coupled to the frame for sustaining the connection means with the measuring means, the member being movable for performing a lowering movement and a lifting movement, the lowering movement causing the measuring means to move towards the horizontal axis, substantially from up to down, due to the force of gravity of the measuring means and connecting means, the lifting movement of the member causing a retraction movement of the measuring means away from the horizontal axis, and wherein the mechanical reference device defines reference surfaces adapted to contact the shaft at the end of said lowering movement, the contact forces between the reference surfaces and the shaft being determined substantially by said force of gravity.

4,351,116
APPARATUS FOR MAKING MULTIPLE ORIENTATION MEASUREMENTS IN A DRILL STRING

Floyd L. Scott, Jr., Houston, Tex., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed Sep. 12, 1980, Ser. No. 186,922
Int. Cl.³ E21B *47/022*
U.S. Cl. 33—307 **4 Claims**



1. An apparatus for making orientation measurements in a drill string comprising:

a tubular housing adapted for insertion into the drill string;

an actuator rod mounted for generally axial movement in the housing;

first and second measuring devices in the housing;

first and second cams in the housing for coupling the actuator rod sequentially to the first and second measuring devices, resepctively, whereby components of the first and second measuring devices can be driven by the actuator rod;

the first measuring device including means responsive to being driven by the actuator rod for measuring a first orientation characteristic of the drill string;

the second measuring device including means responsive to being driven by the actuator rod for measuring a second orientation characteristic of the drill string;

signal generating means comprising means for generating a plurality of pulses responsive to the first and second measuring devices for generating a signal representative of the first and second orientation characteristics;

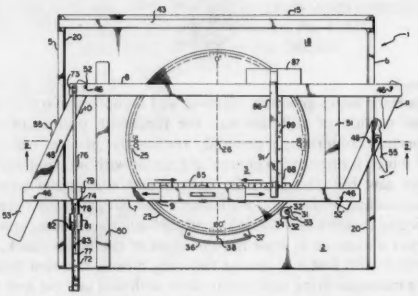
selection means in the housing for causing the signal generating means to respond sequentially to the first and second measuring means whereby the signal is sequentially representative of the first and second orientation characteristics; and

signal identification means for causing the signal from the signal generating means when the latter is responsive to the first measuring means to be different from the signal from the signal generating means when the latter is responding to the second measuring means whereby the signal indicates which of the first and second orientation characteristics is represented by the signal.

4,351,117
DRAWING BOARD APPARATUS

Earl R. Wade, 14912 E. Truman Rd., Independence, Mo. 64050

Filed Jan. 14, 1981, Ser. No. 224,888
Int. Cl.³ B43L *13/02*
U.S. Cl. 33—435 **9 Claims**



1. A drawing apparatus comprising:

(a) a base member having opposite side margins;

(b) a compass rose plate pivotally mounted to said base member between said side margins;

(c) a carriage frame having spaced guide members slidably mounted to said side margins; and

(d) a parallel rule structure having first and second drawing bars and links pivotally mounted thereto and forming an expansible and collapsible parallelogram generally positioned atop said compass rose plate, said links being pivotally mounted to said spaced guide members for sliding movement therewith over said compass rose plate.

4,351,118
APPARATUS AND METHOD FOR CONTINUOUSLY TREATING YARN

George Y. Von Canon, 205 Red Riding Hood Trail, and Aubrey C. Hobbs, 1308 Cinderella Rd., both of Lookout Mountain, Tenn. 37350

Filed Feb. 27, 1981, Ser. No. 239,022
Int. Cl.³ D06B *3/06*
U.S. Cl. 34—24 **17 Claims**

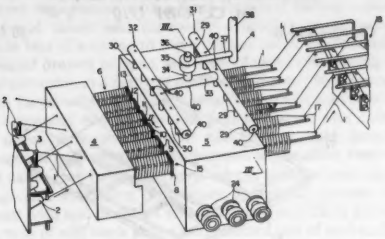
13. A method for treating an indefinite length strand of yarn with steam, comprising:

coiling the strand yarn continuously on a support surface and moving the coiled strand yarn through a steam heated enclosure to drive off previously applied yarn working liquids as a vapor, withdrawing the coiled yarn from the enclosure and uncoiling the steam treated strand yarn;

depositing condensate of said vapor along with airborn strand and filament pieces of the yarn on the interior surfaces of the enclosure thereby forming a progressively increasing thickness mat on the interior surfaces;

periodically discontinuing said steps of coiling, uncoiling,

and applying steam, and removing all strand yarn from the enclosure, and thereafter spraying the interior surfaces of the enclosure that have the greatest buildup of the mat with a liquid solvent thereby substantially removing the



mat from the sprayed interior surfaces, without disassembling the sprayed interior surfaces;

thereafter continuing said steps of coiling, uncoiling, and applying steam for further steam treatment of yarn.

4,351,119

APPARATUS AND METHOD FOR DRYING COMPACT, VITRIFIABLE MIXTURES

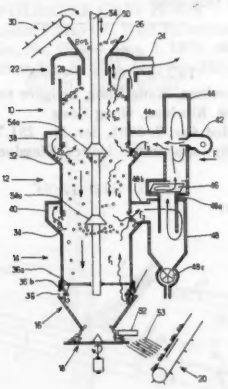
Georges Meunier, Boulogne, France, assignor to Isover Saint-Gobain, Neuilly sur Seine, France

Filed May 27, 1980, Ser. No. 153,789

Claims priority, application France, May 28, 1979, 79 13500

Int. Cl.³ F26B 3/14

U.S. Cl. 34—28 **6 Claims**



1. A process of drying granular product including introducing product into a dryer at one end and moving said product toward the other end in an approximately vertical direction by the force of gravity through a plurality of regions, introducing a fluid for treating said product into said dryer at the other end, and subjecting said product successively, during movement, to a counter-current flow in an upper region; a co-current flow in a central region and a counter-current flow in a lower region, respectively, wherein said flows in said upper and central regions are at temperatures higher than the temperature of said product and said flow in said lower region is at a temperature lower than the temperature of said product, said flow of fluid for treating said product in said central region comprising a recycled portion of said flow which shall have first moved through said lower region, characterized in that said flow in said lower region when contacting said granular product is at a pressure which is equal to or slightly less than the atmospheric pressure.

4,351,120

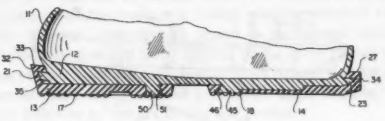
REMOVABLE TRACTION SURFACES FOR FOOTWEAR

Melvin W. Dalebout, Salt Lake City, Utah, assignor to Engineered Sports Products, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 48,986, Jun. 15, 1979, Pat. No. 4,301,564, which is a division of Ser. No. 883,460, Mar. 6, 1978, Pat. No. 4,182,056, which is a continuation-in-part of Ser. No. 711,476, Aug. 4, 1976, Pat. No. 4,078,322. This application Jul. 14, 1980, Ser. No. 168,079

Int. Cl.³ A43B 5/04

U.S. Cl. 36—117 **17 Claims**



1. In a ski boot having a rigid foot enclosure adapted for releasable mounting atop a ski, including a traction member detachable from said foot enclosure with an upper mating surface for attachment adjacent the bottom of said foot enclosure, the improvement comprising:

boss means carried by the bottom of said foot enclosure, including an inclined surface;

aperture means carried by said traction member and arranged to register with said boss means, including an inclined surface mutually adapted with the inclined surface of said boss means to lock the upper mating surface of the traction member against the bottom of said foot enclosure in a press fit engagement, said traction member including:

a sole portion carrying means for engagement by a ski toe binding apparatus; and

a heel portion carrying means for engagement by a ski heel binding apparatus.

4,351,121

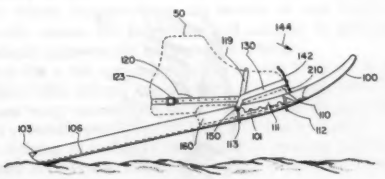
SNOWSHOE

Robert E. Wallace, 12881 Foothill La., Saratoga, Calif. 95070

Filed May 13, 1980, Ser. No. 150,842

Int. Cl.³ A43B 5/04

U.S. Cl. 36—125 **9 Claims**



1. Apparatus for attaching to a boot, or the like, said apparatus comprising:

first loop means for encircling a portion of a boot;

second means coupled to said first loop means for causing said first loop means to move and tighten about the encircled portion of said boot in response to the movement of said second means; and

locking means coupled to said second means for causing said first loop means to remain in a preselected relative position in response to the movement of said second means to a predetermined locking position.

4,351,122

SYSTEM FOR CONTROLLING THE POSITION OF THE DRAG PIPE OF A DREDGE

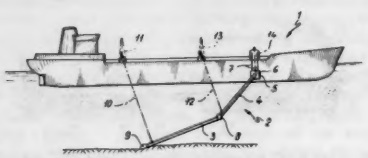
Christiaan A. Cornelis, Papendrecht, and Pieter van Prooijen, Nieuw-Lekkerland, both of Netherlands, assignors to IHC Holland N.V., Papendrecht, Netherlands

Filed Jan. 24, 1980, Ser. No. 118,631

Claims priority, application Netherlands, Jan. 25, 1979, 7900595

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—58 5 Claims



1. In a dredge having a drag pipe comprised by a number of pipe sections interconnected by hinged joints, drag lines connected to said hinged joints and to the front and rear end of the drag pipe, vertical guide elements on the side of the ship that rotatably and vertically movably support the front end of the drag pipe, a drag head on the rear end of the drag pipe, and means for moving the drag pipe outboard and inboard; the improvement comprising means for separately measuring the length of each drag line unwound from the associated said winch, an electronic control unit that controls the position of the drag pipe on the basis of said measured lengths, such that the angle between the hingedly joined drag pipe sections is maintained between predetermined limit values under all circumstances, and means to control the inclination of the rear section of the drag pipe during dredging to adapt the drag pipe to optimum output of material from the dredging operation dependent on the type of soil of the bottom to be dredged.

4,351,123

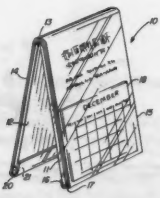
DISPLAY MOUNT AND METHOD

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed Jan. 22, 1981, Ser. No. 227,425

Int. Cl.³ G09D *3/04*

U.S. Cl. 40—120 12 Claims



1. A display mount comprising in combination:

a plurality of casebound panels connected together along at least one edge of each panel to define at least one hinged area;

a transparent polymer material overlaying said casebinding material of at least a portion of two panels and extending over said hinged area to form at least two transparent pockets, whereby display material mounted in a pocket is held in place by bending one panel relative to a second on said hinged area having said polymer material extending thereover.

4,351,124

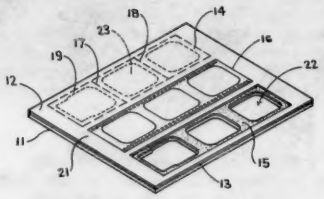
FILM MOUNT WITH PROTECTED FACE SHEET

Marvin L. Sivertsen, Milwaukee, and Valentine S. Sobolewski, Muskego, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jan. 14, 1981, Ser. No. 224,910

Int. Cl.³ G09F *1/10*

U.S. Cl. 40—158 B 20 Claims



11. An improved radiographic film mounting frame of the type having face and backing sheets adhesively attached in a temporary manner such that at least a portion of the backing sheet can be removed to expose an adhesive remaining on the mount such that a film strip can be applied to the adhesive for retention and viewing, said face sheet having at least one aperture therethrough for allowing illumination of said radiographic film, wherein the improvement comprises a thin protective sheet disposed between said face sheet and said adhesive so that when the film strip is applied to the adhesive, it does not attach directly to said face sheet but rather to said protective sheet which will allow a subsequent removal and replacement of the film strip without any degradation in the integrity of the face sheet.

4,351,125

TELEPHONE INDEX

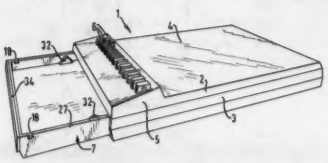
Se-kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Apr. 7, 1981, Ser. No. 251,773

Claims priority, application United Kingdom, Apr. 9, 1980, 8011669

Int. Cl.³ B42F *17/34*

U.S. Cl. 40—381 3 Claims



1. In a telephone index, comprising a stand on which a telephone may be placed and an index comprising a stack of cards, any selected one of which said cards can be presented for inspection upon pressing the respective one of a plurality of buttons, wherein said stand is in the form of a box, a drawer is slidable in said box and is spring-loaded for outward movement upon depression of any one of said plurality of buttons to present the particular one of said cards selected as the upper card in said drawer, any of said cards of said stack which are located at a position above said particular one of said cards selected being retained in said box and not moving outwardly with said drawer, the improvement comprising: a plurality of levers mounted in an upper part of said box, extending from the front toward the rear thereof, said levers being pivotally mounted about a common transverse and generally horizontal axis located at a position forwardly of said plurality of push buttons, each having an arm extending forwardly of the pivot

axis and an arm extending rearwardly of the pivot axis with a downwardly extending projection at its rear end and each cooperating with a respective one of said push buttons such that pressing any one of said push buttons depresses said rearwardly extending arm of the respective one of said levers to move said downwardly extending projection thereof downwardly into engagement with a fixed abutment surface within said box and raises said forwardly extending arm thereof against the bias of a spring to trip a drawer catch to allow said spring biased drawer to open, and each of said cards having at least one extension at a rear end thereof, said extensions having apertures therein through which selected ones of said downwardly extending projections can pass to secure said cards against outward movement with said drawer; said drawer having upstanding entraining projections at the sides thereof and said cards each having portions cut out to allow said cards to engage said entraining projections, thereby to entrain for movement with said drawer a selected one of said cards and all of said cards of said stack below said selected one of said cards; and wherein to reduce frictional drag tending to retain entrained ones of said cards in said box and to assist return of said extensions of said cards not retained in said box onto said abutment surface upon re-closing of said drawer, a rear portion of said deck of said drawer, on which said rear portion said cards lie, is provided with longitudinally extending alternating ribs and grooves, and a freely slidable intermediate member is provided having an upper surface of the same form as said rear portion of said deck and having an undersurface thereof grooved to receive said ribs on said rear portion of said deck, the front edge of said abutment surface and the front edge of said intermediate member having projecting tongues which lie in said grooves of said intermediate member and said grooves of said rear portion of said deck, respectively.

4,351,126

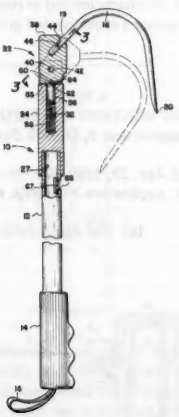
FOLDABLE GAFF HOOK

Theodore K. Simonson, 5 May Ct., West Hempstead, N.Y. 11552

Continuation of Ser. No. 99,404, Dec. 3, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,243

Int. Cl.³ A01K *97/14*

U.S. Cl. 43—5 **4 Claims**



1. A foldable gaff comprising

an elongated shaft having a handle at a first end thereof;

a cam plate member pivotally secured to a second end of the shaft, a curved hook secured to the cam plate member, an arcuate shaped cam surface carried by the cam plate member and having first and second spaced notches therein;

an elongated longitudinal recess in the second end of the shaft, an elongated cam follower reciprocally carried in the recess, a compression spring carried in the recess for urging the cam follower outwardly against the cam surface of the cam plate member, said cam follower comprising a shaped protrusion at the outer end thereof for engaging the cam surface and complimentary with the spaced notches therein, said protrusion comprising a pair of intersecting plane surfaces, the planes defined by said plane surfaces being parallel to the pivotal axis of the cam plate member wherein in a fully open position said cam follower protrusion is seated in the first notch whereupon pressure applied to the hook toward a closed position causes the cam surface adjacent the first notch to press against one of the plane surfaces of the protrusion forcing said cam follower to retract within said recess to enable movement of the hook to a folded position wherein said cam follower protrusion is seated in the second notch, whereby an opening force applied to the hook causes the cam surface adjacent said second notch to bear against the second plane surface of the protrusion again causing the cam follower to retract within said recess.

4,351,127

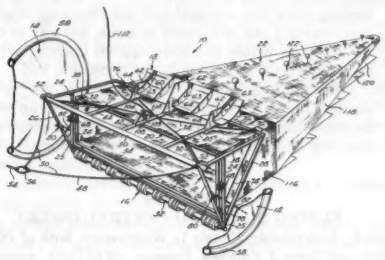
OCEAN BOTTOM SAMPLER

Charles T. Mitchell, 10771 Morada Dr., Orange, Calif. 92669

Continuation of Ser. No. 958,788, Nov. 8, 1978, abandoned. This application Oct. 16, 1980, Ser. No. 197,624

Int. Cl.³ A01K *73/02*

U.S. Cl. 43—9 **12 Claims**



1. An ocean bottom sampler, comprising:

a body defining an unobstructed, forwardly facing opening located near the ocean floor;

a pair of wheels each having a large diameter, one of said wheels attached to either side of said body, said wheels being capable of traveling over rough ocean bottom terrain;

a plurality of rollers considerably smaller in diameter than said wheels attached along the bottom of said body to provide means for permitting said sampler to traverse obstacles encountered between said wheels;

a frame for a net opening attached to said body so as to substantially occupy said unobstructed opening, said net frame being mounted on said body for rotation about an axis generally parallel to the axis of said wheels; and

a net defining an enclosure and having an opening attached to said net frame so that said opening is close to the ocean floor.

4,351,128

FISH LINE BOBBER/SINKER

John W. Sivertsen, Minneapolis, Minn., assignor to Carlton F. Peterson, Rush City, Minn., a part interest

Filed Feb. 12, 1981, Ser. No. 233,914

Int. Cl.³ A01K *95/00*

U.S. Cl. 43—44.91 **7 Claims**

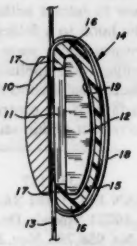
1. A fish line device comprising:

(A) an elongated generally barrel-shaped body having a central longitudinal opening extending therethrough,

(B) a longitudinally and radially extending slot open from the central opening to the outside of the body from one end of the central opening to the other,

(C) a fish line retaining clip having an ear pivotally mounted with respect to each end of the body central opening and having a longitudinally extending bow integrally connected between said ears,

(D) a fish line receiving channel outwardly positioned on each of said retaining clip ears, said fish line receiving channels extending in longitudinal alignment with the clip bow so as to be in radial alignment with the body slot and



being of shape and size to receive a fish line and to position it within said sinker body central opening when said clip is aligned with said body opposite said longitudinally extending body slot, and said fish line receiving channels in said retaining clip ears being of shape and size to confine the fish line within the body central opening when the retaining clip is aligned with the body slot, and

(E) a further longitudinally extending fish line receiving channel in the outer surface of the retaining clip bow and in communication with said ear channels, whereby the fish line may be looped around said clip and body.

4,351,129

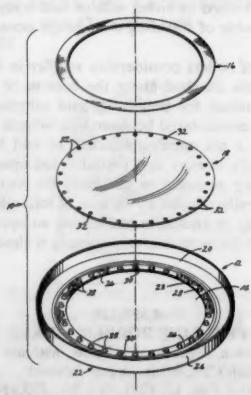
FLYING DISC WITH CENTRAL INSERT

Darle L. Kerkenbush; Jimmie L. Whittington, both of Diamond Bar, and Terry J. Sanchez, Pomona, all of Calif., assignors to Wham-O Mfg. Company, San Gabriel, Calif.

Filed Sep. 26, 1980, Ser. No. 191,073

Int. Cl.³ A63H *27/00*

U.S. Cl. 46—74 D **59 Claims**



1. A circular flying disc comprising:

an annular section comprising an aperture through its center, an inner periphery and an outer periphery, a generally concave inner surface, a generally convex outer surface, and a rim extending around the outer periphery wherein one of the surfaces of the annular section comprises a plurality of spaced apart pegs positioned around the inner periphery;

an insert disposed across the aperture; and

a closed strip fusion bonded to the surface of the annular section comprising the spaced apart pegs, the fusion bond between the closed strip and such a surface of the annular section formed by heating a surface of the closed strip to melt such a strip surface and heating the surface of the annular section to melt such an annular section surface and then contacting the melted surface of the strip with the melted surface of the annular section so that the surfaces solidify together for forming the fusion bond between the closed strip and the pegs, said fusion bond permanently securing the insert in place across the aperture.

4,351,130

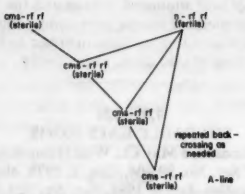
RECESSIVE TALL—A FOURTH GENETIC ELEMENT TO FACILITATE HYBRID CEREAL PRODUCTION

J. Neil Rutger, Davis, and Howard L. Carnahan, Biggs, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 16, 1981, Ser. No. 274,087

Int. Cl.³ A01G *1/00*

U.S. Cl. 47—58 **10 Claims**



1. A method of producing hybrid seed, comprising:

growing together in pollinating proximity male pollinator plants which are characterized as recessively-inherited tall plant types having a recessive tall gene, and shorter female plants.

4,351,131

SLIDING WINDOW OR SLIDING DOOR

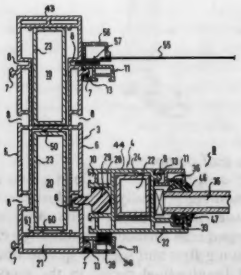
Hans Kubik, Blumenstrasse 5, D-8465 Bodenwohr, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,587

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011946

Int. Cl.³ E06B *3/00*

U.S. Cl. 49—501 **17 Claims**



1. A glazed assembly comprising:

a frame assembly formed of at least four frame parts having identical and substantially rectangular cross-sectional shapes and the frame assembly being fastened to a structure; and

at least one sash assembly that is formed of at least four sash parts having identical cross-sectional shapes and a glazing, the sash assembly being mounted in said frame assembly and being slidable and lockable therein;

each of said frame parts having a pair of sides opposite one another with one side facing the sash assembly and the other side facing the structure, the pair of sides presenting engaging elements and guide grooves;

each of said sash parts presenting engaging elements and guide grooves; and

the engaging elements of the frame and sash parts having identical cross-sectional shapes and the guide grooves of the frame and sash parts having identical cross-sectional shapes and the engaging elements and guide grooves having intermating cross-sectional shapes.

4,351,132

MACHINE FOR CLEANING VERTICAL OR INCLINED SURFACES

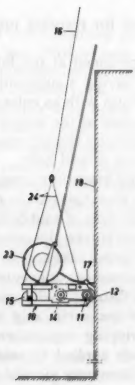
Roland Molin, Gothenburg, Sweden, assignor to PR Processutveckling AB, Vastra Frolunda, Sweden

Filed Sep. 25, 1980, Ser. No. 190,567

Claims priority, application Sweden, Sep. 28, 1979, 7908048

Int. Cl.³ B24B *23/00*

U.S. Cl. 51—180 **8 Claims**



1. A machine for cleaning vertical or inclined walls, especially reactor cavity walls in a nuclear power plant, comprising at least one roller brush supported by a frame, said frame being freely suspended by at least one wire from a lifting device and which frame, at the side remote from the roller brush, is provided with a counterweight means, said roller brush comprising a plurality of soft grinding sheaves attached to a shaft, said grinding sheaves being axially compressible by a compressing means in order to change the density of the roller brush and the contact surface against the wall to be cleaned, said counterweight means being provided with means for increasing or decreasing its weight and changing the position of the center of gravity of the machine and thus changing the bearing pressure against the wall.

4,351,133

ABRASIVE PAPER CONNECTION FOR USE ON AN OSCILLATING GRINDER

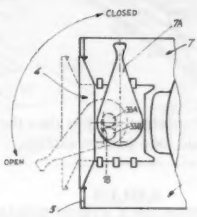
Kurt Stoll, Lenzhalde 72, 7300 Esslingen am Neckar, and Dieter Tschacher, Hohenzollernstrasse 4, 7313 Reichenbach, both of Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,322

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929618

Int. Cl.³ B24B *23/04*

U.S. Cl. 51—358 **11 Claims**



1. In an abrasive paper connection for use on an oscillating grinder having a table plate which has an end surface and can be moved by a drive mechanism, and having at least one tensioning device for securing an abrasive paper which is guided along the underside of the table plate, the improvement comprising wherein the tensioning device includes a clamping slide which is movably guided on the table plate and has an edge portion which can at least partially be applied against the end surface of the table plate, and includes a manually operable eccentric mechanism which controls movement of the clamping slide toward and away from the end surface, said eccentric mechanism including:

(a) a manually operable locking handle having a cylindrical guide surface thereon;

(b) a further guide surface on said clamping slide complementary to said guide surface on said locking handle and operatively associated therewith;

(c) an eccentric pin on said locking handle, the axis of which extends parallel and offset with respect to the axis of said guide surface on said locking handle;

(d) a slotted hole provided in the upper side of said table plate and extending transversely with respect to the direction of movement of said clamping slide, into which slotted hole extends said eccentric pin; and

(e) a device, which linearly guides said clamping slide.

4,351,134

HINGED GUTTER GUARD

James A. Clarkson, 257 Jeffery La., Northfield, Ill. 60093

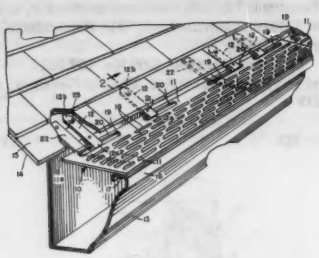
Filed Mar. 4, 1981, Ser. No. 240,376

Int. Cl.³ E04D *13/00*

U.S. Cl. 52—12 **8 Claims**

1. In combination with the sloping roof of a building having a generally horizontal open-topped gutter extending alongside a lower edge thereof, a gutter guard comprising a rigid perforated rectangular cover plate extending over a longitudinal segment of said gutter, said cover plate having a plurality of elongated slots arranged in serial alignment along one of the longitudinal edges thereof, hinge bar means extending along each of said slots, and a plurality of hinge straps each having a closed loop portion extending through one of said slots and about said hinge bar means, and having a tongue portion fixed

to the lower portion of said roof, for pivotally supporting said cover plate over said gutter, the loop portion of each of said



straps having a width substantially less than the length of the slot through which said loop portion extends.

4,351,135

LENGTH-ADJUSTABLE STRUCTURAL UNIT

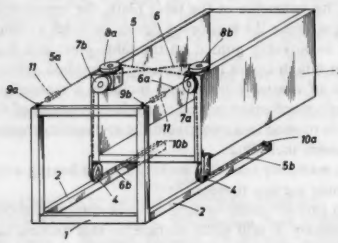
Walter Freller, Wallernstrasse 20, A-4522 Sierning, Austria

Filed Jun. 24, 1980, Ser. No. 162,622

Claims priority, application Austria, Jun. 29, 1979, 4591/79

Int. Cl.³ E04B *1/343*

U.S. Cl. 52—67 **3 Claims**



1. In a length-adjustable structural unit including

a carrying part having a near end and a far end spaced apart in a first direction and a bearing surface extending in said first direction and in a second direction that is transverse to said first direction,

an extension part mounted on said carrying part in contact with said bearing surface and extensible and retractable relative to said carrying part generally in said first direction, and

constraining means comprises first and second tensile elements, each of which is supported by said carrying part at a first point near said near end and a second point near said far end, and a plurality of deflecting rollers, which are rotatably mounted on said extension part and around which said tensile elements are trained, said deflecting rollers for each of said tensile elements comprising first and second rollers that are nearest to said first and second points for the respective tensile elements, measured along the same, and are so designed and arranged that the respective tensile element extends substantially in said first direction from each of said first and second points to the first and second deflecting rollers, respectively at least two of said deflecting rollers for each of said tensile elements being spaced apart in a second direction, which is at right angles to said first and second directions,

corresponding portions of said tensile elements extending generally in said first direction being disposed on opposite sides of said extension part, whereby said constraining means hold said extension part against tilting transversely to said first and second directions even when said extension part is extended,

the improvement comprising:

third deflecting rollers around which each of said tensile elements is trained, each of said third deflecting rollers being spaced from one of said deflecting rollers for the same tensile element in a direction which is parallel to said bearing surface and transverse to said first direction, so that said constraining means are arranged to hold said extension part against canting relative to said carrying part in said second direction.

4,351,136

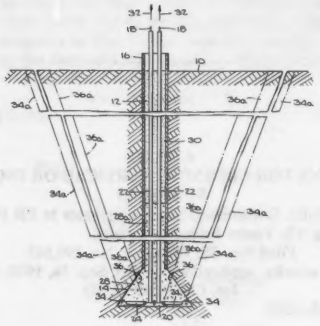
GROUND ANCHOR INSTALLATION

Francis M. Fuller, Houston, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Filed Jan. 14, 1980, Ser. No. 111,547

Int. Cl.³ E02D *5/76*

U.S. Cl. 52—155 **19 Claims**



1. A ground anchor for resisting uplift loads, said ground anchor comprising

an anchor plate positioned at the bottom of a hole in the earth, said hole having a substantially uniform diameter throughout its length with an enlarged portion of substantially larger diameter at the bottom of the hole, and said plate having a diameter slightly smaller than the diameter of the shaft portion of said hole,

a plurality of radially extending arms projecting outwardly from said anchor plate toward the outer periphery of said larger diameter portion of said hole,

a concrete base filling at least the enlarged bottom portion of said hole and covering said anchor plate and arms,

at least one tension member connected to said anchor plate and extending up through said concrete base and said hole to the surface of the earth, said tension member being insolated from gripping engagement by said base,

whereby uplift loads applied to said tension member are transferred therefrom only via said anchor plate and arms to said concrete base to subject said concrete base primarily to compressive forces and to produce a shear plane in said base extending upwardly and outwardly from the outer tips of said arms and continuing up through the overlying earth.

4,351,137

PLASTIC PANEL MOUNTING FRAME

Charles E. Enyart, and John E. Shoulis, both of Dallas, Tex., assignors to Baxt Industries, Inc., Addison, Tex.

Filed Jan. 21, 1980, Ser. No. 113,730

Int. Cl.³ E06B *3/28;* E04C *2/38, 2/54*

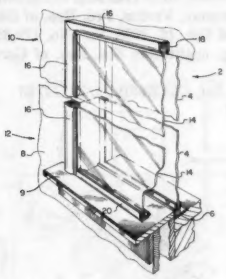
U.S. Cl. 52—202 **3 Claims**

1. In a panel mounting molding of the type comprising a base adhesively secured to a window frame and an interlocking

pane biasing strip for positively holding a glazing pane against said base, the improvement comprising:

a base having an elongated rectangular web having one surface for adhesive securement to a window frame, and a second surface carrying on a first edge, an upstanding pane supporting flange and, on a second edge, an upstanding boss, said upstanding boss comprising a pair of spaced jaws, said jaws having opposed faces defining a channel having an opening opposite said web, each of said faces carrying three ridges, with said ridges positioned in three opposing pairs, the peaks of the ridges of the outermost pair of said ridges being formed to define said opening of said channel,

a pane biasing strip comprising an elongated generally rectangular anchor for interlocking with said base, and a leaf extending obliquely from one edge of said anchor for holding a glazing pane against said pane supporting flange, said anchor having on each of two opposite surfaces thereof three opposing grooves corresponding to the three pairs of ridges carried by said jaws, and a leading edge of said anchor distal of the first of said pairs of said grooves having a maximum thickness less than the maximum thickness of the remaining portions of said anchor between the first and third of said pairs of said grooves whereby insertion of said anchor past said outermost pair of ridges into said channel is facilitated,



said base and said biasing strip being adapted for selective interlocking in at least first and second positions, said first position being the complete insertion of said anchor into said channel and resulting in mating of all three pairs of said ridges with all three pairs of said grooves, and said second position being the partial insertion of said anchor into said channel and the mating of two of said pairs of said ridges with two of said pairs of said grooves, said leaf including a continuously curved portion, and being aligned with said pane supporting flange so that said leaf and said pane supporting flange form a substantially continuous surface in at least one of said first and second positions, and

said leaf being positioned relative to said pane supporting flange to allow mounting of panes up to about $\frac{1}{8}$ inch in thickness at said first interlocking position, and panes from about $\frac{1}{8}$ to about $\frac{1}{4}$ inch in thickness at said second interlocking position.

4,351,138

ROOF CONSTRUCTION AND METHOD THEREOF

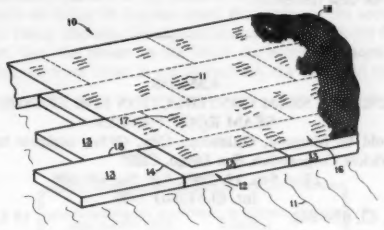
William J. McMillan, and Jerry L. Severson, both of Newark, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 39,462, May 16, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,298

Int. Cl.³ E04B *7/00*

U.S. Cl. 52—309.4 **10 Claims**

1. A roof structure comprising a roof support means having a roof deck, the roof deck having an upper surface and a lower surface, the upper surface of the roof deck supporting a water impermeable membrane, the impermeable membrane having an upper face and a lower face, the lower face being generally adjacent the roof deck; a thermally insulating layer disposed adjacent the upper face of the water impermeable membrane, the thermally insulating layer comprising a plurality of closed cell water impermeable insulating members, the insulating members defining fissures between adjacent members, a coherent water permeable fabric layer disposed over the insulating members, the coherent water permeable layer being affixed to the insulating members, whereby in the event of ponding, the insulating members will float and be generally uniformly displaced according to the amount of water in a particular area of the roof, and the insulating members generally will not displace relative to adjacent members.



4,351,139

CONNECTING ELEMENT FOR CONCRETE OR REINFORCED CONCRETE STRUCTURAL MEMBERS THAT ARE TO BE CAST ONE AFTER THE OTHER

Peter Gander, Thun-Gwatt, Switzerland, assignor to Armex AG, Thun-Lerchenfeld, Switzerland

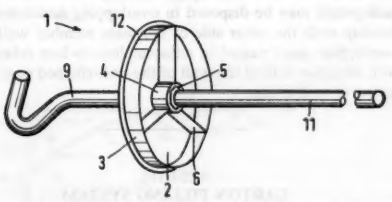
PCT No. PCT/CH79/00095, § 371 Date Jul. 14, 1980, § 102(e) Date Jul. 14, 1980, PCT Pub. No. WO80/01088, PCT Pub. Date May 29, 1980

PCT Filed Jun. 28, 1979, Ser. No. 224,285

Claims priority, application Switzerland, Nov. 20, 1978, 11853/78; Jun. 8, 1979, 5348/79

Int. Cl.³ E04B *1/41*

U.S. Cl. 52—378 **20 Claims**



1. A connecting element for concrete and reinforced concrete structural members, that are to be cast one after the other, comprising

a hollow body (1;21) having a base portion (2; 26) and a shell portion (3;27), said shell portion (3; 27) having an edge lying in a plane and encircling an opening;

a projection or sleeve (4; 30, 31) securely connected in said hollow body (1;21) and projecting from said base portion (3; 37) towards said plane and including a threaded hole (5; 34, 35) being accessible at both ends;

said hollow body (1; 21) having through-holes (7; 42) adapted to receive nails for releasable fastening the hollow body to a shuttering (8) and tightly butting said edge of the shell portion (3; 27) against the shuttering (8); and

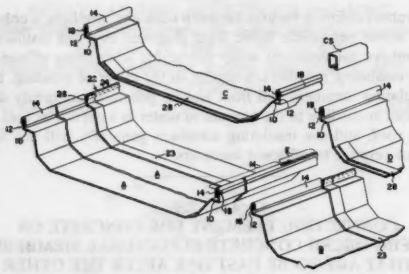
two reinforcing parts (9, 11; 22, 24; 23, 25) provided at one end with an external thread of which one (9; 22; 23) is to be screwed, for embedding into the structural member (10) that is to be cast first of all, into one half of said threaded hole (5; 34, 45) and the other of which (11; 24; 25) is to be screwed, after removal of the shuttering (8), into the other half of said threaded hole (5; 34, 35) and is to be embedded into the other structural member that is to be cast thereafter.

4,351,140

END LAP SEAM CONSTRUCTION FOR STANDING SEAM ROOF PANELS

Harold G. Simpson, Oklahoma City, Okla., assignor to The Wickes Corporation, San Diego, Calif.

Filed Sep. 19, 1980, Ser. No. 188,608
Int. Cl.³ E04D *1/00*
U.S. Cl. 52—542 **18 Claims**



1. A generally rectangular standing seam roof panel having an upstanding seam member extending the entire length of at least one longitudinal side edge of said panel, said seam member including a longitudinally extending outer wall, a mastic waterproofing bead located on and extending the entire length of said wall at the outer side thereof, and means defining an endlap notch in said seam member at one end of said panel having a longitudinally extending notch edge located above said bead and below the top of said outer wall whereby two such panels may be disposed in overlapping end-to-end relationship with the outer side of the seam member wall of the overlapped panel nested in adjacent face-to-face relationship with the inner side of the wall of the underlapped panel in the region of said notch.

4,351,141

CARTON FILLING SYSTEM

Paul H. Glorfield, Caldwell; Spencer L. Bryant, Nampa, both of Id., and Vance L. Kirklin, Hermiston, Oreg., assignors to J. R. Simplot Company, Boise, Id.

Filed Aug. 25, 1980, Ser. No. 180,971
Int. Cl.³ B65B *5/10, 1/06, 1/08*
U.S. Cl. 53—473 **49 Claims**

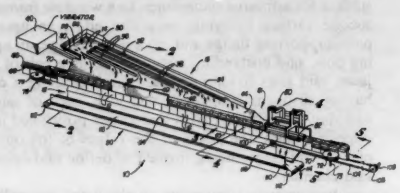
34. A method of filling cartons with a plurality of relatively small product strips, comprising the steps of:

conveying a plurality of upwardly open cartons in succession along a first path;

conveying a plurality of the product strips along a second path for intersection with the first path;

forming the plurality of product strips into substantially a common plane during movement along the second path;

orienting a majority of the product strips to extend substantially in longitudinal alignment with the second path during movement along the second path; and



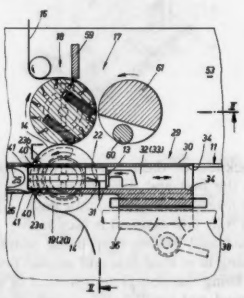
continuously guiding the oriented product strips in the common plane angularly downwardly and laterally over a guide ramp into the cartons conveyed along the first path.

4,351,142

APPARATUS FOR WRAPPING OBJECTS, IN PARTICULAR GROUPS OF CIGARETTES

Heinz H. Focke; Kurt Liedtke, both of Verden, and Hans J. Bretthauer, Bremen, all of Fed. Rep. of Germany, assignors to Focke and Company, Verden, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,856
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906204
Int. Cl.³ B65B *19/24, 11/08*
U.S. Cl. 53—575 **18 Claims**



1. A wrapping apparatus for wrapping groups of unpackaged elongated stress-sensitive objects which are conveyed in a forward direction along a longitudinal path, said apparatus comprising:

feeding means for continuously feeding a sheet-like wrapping material downwardly into said path;

cutting means for continuously cutting said material into individual sheets;

said feeding means comprising rotary suction means on the lateral side of said path for gripping the portion of said sheet that is located above and below said longitudinal path before the groups contact the sheet by subjecting the longitudinal marginal portions thereof to frictional suction forces continuously to feed said sheets downwardly into said path, said suction means rotating about an axis perpendicular to said path;

a hollow elongated receiver for receiving each group of objects and disposed in said path, said receiver having an interior cross-section corresponding to that of said group, whereby the shape of said group is maintained;

means for continually conveying said groups through the receiver;

means for imparting longitudinally reciprocating movement to said receiver as said group of objects moves therethrough toward said sheet of wrapping material so that

the forward end of said receiver moves against said sheet of wrapping material before each group of objects reaches said forward end, and so that said forward end strips said sheet from said suction means before the forward end of said group reaches said sheet, whereby said sheet is folded in a U-shape around said group and in direct contact therewith as said group continues to move forward, without subjecting said group to the stress of removing said sheet from said suction means; and

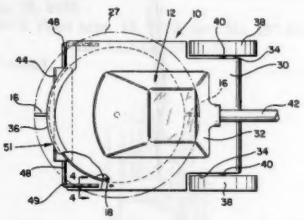
vent means, responsive to a predetermined rotational position of said rotary suction means, for venting the suction to release said portion of said wrapping material that is located above and below said path right after said receiver and objects move against said sheet and before said sheet is stripped from said suction means by said receiver.

4,351,143

GROUND SUPPORT SYSTEM FOR A GRASS CUTTING MACHINE

William R. Lessig, III, Cockeysville, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 30, 1981, Ser. No. 259,485
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—17.5 **6 Claims**



1. A grass cutting machine having a motor powered cutting blade defining a cutting circle lying in a substantially horizontal plane, the machine comprising:

(a) a housing carrying the motor and to journal the cutting blade in a substantially vertical axis,

(b) the housing having a front, a rear, and opposed sides extending therebetween to terminate at right and left front corners and right and left rear corners,

(c) the front and opposed sides of the housing each having substantial portions thereof within the cutting circle,

(d) a pair of wheels journaled at opposite sides of the rear of the housing with their axes disposed above the plane of the cutting circle.

(e) a roller disposed below the plane of the cutting circle and within the cutting circle to extend longitudinally across the front of the housing, and

(f) support means journaling the roller, and extending therefrom within the cutting circle and below the cutting plane to intersect the cutting plane outside of the cutting circle adjacent the front corners for connection to the housing above the cutting plane.

4,351,144

COMMINUTING POWERED LAWN MOWER

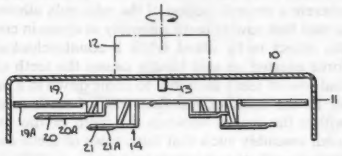
Salvatore Benensti, 77 Woodside Dr., Red Bank, N.J. 07701

Continuation-in-part of Ser. No. 51,025, Jun. 22, 1979, Pat. No. 4,262,476. This application Mar. 31, 1981, Ser. No. 249,450
The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **5 Claims**

1. A powered lawn mower adapted to comminute grass to provide a mulch for a substantially planar grass lawn, said mower being provided with means to advance the mower in a horizontal path on said lawn toward unmown grass and comprising:

A. an inverted housing on which a motor is supported, the motor having a drive shaft extending into the housing at right angles to the plane of said lawn; and

B. a rotor secured to the shaft and disposed within the housing, said rotor being constituted by a hub from which radiate three sets of blades lying in respective planes substantially parallel to the plane of said lawn, the blades in each set being 90 degrees apart, the blades of the second set being displaced 30 degrees from the blades in the first set, and the blades in the third set being displaced 30 degrees from those in the second set, the blades in these



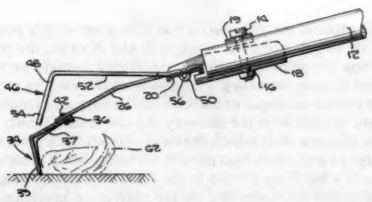
sets being at progressively decreased levels relative to the lawn, the blades in the first set having a length providing the longest reach, and the blades in the second and third sets having progressively reduced lengths, each blade having a leading edge defining a cutting edge which is pitched to form an air foil acting to create an updraft, whereby as the rotor rotates and the mower is advanced in said horizontal path toward unmown grass, the first set of blades having the longest reach act to cut pieces from the upper portions of the grass, this action being followed by the blades in the second set and then the blades in the third set, each acting to cut pieces from the grass at the level corresponding to the set level whereby each blade of grass is cut into as many pieces as there are sets.

4,351,145

COMBO HAND RAKE

Peter E. Farkas, La Puente, Calif., assignor to Laszlo Szentkiralyi and Istvan Csoke, both of Venice, Calif., a part interest to each

Filed Feb. 2, 1981, Ser. No. 230,865
Int. Cl.³ A01D *7/00*
U.S. Cl. 56—400.16 **10 Claims**



1. A hand rake comprising:

a. an elongated handle;

b. an elongated head member removably attached at the central portion of its longitudinal axis to one end of and perpendicular to said elongated handle;

c. a first elongated connecting bar rigidly attached at one end to one lateral edge of said elongated head member;

d. a second elongated connecting bar rigidly attached at one end to the second lateral edge of said elongated head member;

e. a first row of teeth assembly consisting of a multiplicity of parallel teeth spaced apart from each other in a single row;

f. said first row of teeth assembly spaced apart from but

removably and rigidly attached adjacent its lateral edges to said elongated head member by said first and second connecting bars respectively, such that the multiplicity of teeth in said first row of teeth assembly do not move relative to said elongated head member and said handle;

g. a second row of teeth assembly consisting of a multiplicity of parallel elongated teeth spaced apart from each other;

h. said teeth in said second row of teeth assembly removably and movably attached to said head member such that the elongated teeth of the second row of teeth assembly lie in a plane above the teeth in the first row of teeth assembly and are capable of movement relative to said first row of teeth assembly such that the teeth in the second row of teeth assembly can be placed into operation in the spaces between the teeth in the first row of teeth assembly; and

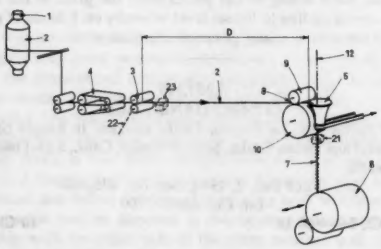
i. wherein a normal motion of the rake only allows the teeth in said first row of teeth assembly to come in contact with the object to be raked while a counterclockwise tilting force exerted on said handle causes the teeth of said second row of teeth assembly to come down in a plane parallel to the teeth of the first row of teeth assembly and within the spaces between the teeth of the first row of teeth assembly such that both rows of teeth can come in contact with the object to be raked.

4,351,146

PROCESS AND DEVICE FOR PRODUCING A YARN HAVING ALTERNATE TWISTS OF OPPOSITE DIRECTIONS

Jean-Louis Faure, Roanne, and Michel Vanhelle, Lille, both of France, assignors to ASA S.A., France

Filed Jul. 7, 1980, Ser. No. 166,331
Claims priority, application France, Sep. 7, 1979, 79 18173
Int. Cl.³ D01H *5/28, 5/18;* D02G *3/22, 3/36*
U.S. Cl. 57—6 **15 Claims**



1. A process for the production of a yarn which possesses along its length alternate zones of S and Z twist, the process involving the steps of positively delivering a single yarn via a delivery device, imparting a false twist to the yarn by means of a false twister acting continuously on the yarn and located at a position spaced from the delivery device, intermittently varying the distance over which the twist extends back upstream of the false twister, such intermittent variation being achieved by means of a blocking device in the form of a positive delivery device acting intermittently on the yarn at an upstream point close to the false twister, the duration of action of the blocking device approximately corresponding to the time taken for a point on the yarn to travel from the delivery device to the false twister, and winding up the yarn so that the wound up yarn possesses, along its length, alternate zones of S and Z twist.

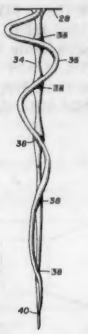
11. A device for the production of a yarn which possesses, along its length, alternate zones of S and Z twist, such device comprising in combination a first delivery device for delivering a single yarn, a false twister to act continuously on the yarn to impart a false twist to the yarn, and means intermittently to vary the distance which the twist extends back upstream from the false twister, such means including a blocking device in the form of a positive delivery device located at an upstream point close to the false twister, and means causing said blocking device to act intermittently on said yarn for a time corresponding to the time taken for a point on the yarn to travel from the yarn delivery device to the false twister, and means to wind up the yarn.

4,351,147

SPUN-LIKE YARN

Lawrence E. Blackmon, Foley, Ala.; Darrell A. Kelly, Milton, Fla.; Wayne T. Mowe, and Jing-peir Yu, both of Pensacola, Fla., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 101,957, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 925,073, Jul. 17, 1978, abandoned. This application Oct. 17, 1980, Ser. No. 197,889
Int. Cl.³ D02G *3/24, 1/18;* D01D *5/22*
U.S. Cl. 57—208 **5 Claims**



1. A textured yarn having a soft luxuriant hand and improved wicking, comprising:

a. a first plurality of filaments comprising alternating S-twisted and Z-twisted helically coiled regions connected by twist reversal regions, each of said first plurality of filaments having a cross-sectional area which varies from small values in thin regions to large values in thick regions along its length, said large values being at least 25% greater than said small values, said thick and thin regions being out of phase from filament to filament along the length of said yarn, and

b. a second plurality of filaments comprising alternating S-twisted and Z-twisted helically coiled regions connected by twist reversal regions, each of said second plurality of filaments having a cross-section comprising a spiral and wherein the outer portion of said spiral lies at the inside of the coils of said helically coiled regions.

4,351,148

FALSE TWISTED SLUB YARN

Paul W. Eschenbach, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 93,199, Nov. 13, 1979, Pat. No. 4,305,245. This application Jan. 8, 1981, Ser. No. 223,273
Int. Cl.³ D02G *3/34*
U.S. Cl. 57—209 **4 Claims**

1. A novel slub yarn comprising: at least two commingled,

false twisted, multi-filament, continuous synthetic yarns having a plurality of slubs spaced along the length thereof and each of said slubs having a nub closely adjacent thereto, said nub having a length substantially less than the length of said slubs, said slub and said nub having substantially the same false twist therein.

4,351,149

SPINDLELESS SPINNING MACHINE

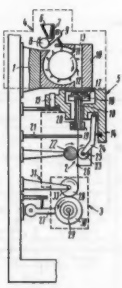
Abdurakhim Abduganiev, Chilanzar, D-20, 33, kv. 7, Tashkent; Timur P. Krjuk, prospekt Mira, 90, kv. 11, Moscow; Vitaly I. Zhestkov, Chilanzar, kvartal 19, 26, kv. 41, Tashkent; Valentin N. Tikhonov, ulitsa Sh.Rustaveli, 55, kv.28, Tashkent; Vladimir G. Glazov, Chilanzar, kvartal 19, 26, kv. 23, Tashkent; Mikhail M. Kletny, poselok Pirogovsky, ulitsa Sovetskaya, 7, kv. 70, Moskovskaya oblast; Gennady N. Shlykov, Chilanzar, kvartal 19, 31, kv. 3, Tashkent; Vladimir K. Afanasiev, Golyanovsky proezd, 4, kv. 129, Moscow; Vasily M. Dyachkov, zhiloi massiv Kuiljuk, 23, kv. 11, Tashkent; Gennady V. Zhigalov, ulitsa B. Khmelnitskogo, 68, korpus 2, kv. 68, Tashkent; Rafael A. Mangutov, ulitsa Sh.Rustaveli, 59, kv. 10, Tashkent, and Ernst I. Angarov, Serpukhovskoi val, 13a, kv. 4, Moscow, all of U.S.S.R.

PCT No. PCT/SU79/00013, § 371 Date Nov. 13, 1980, § 102(e) Date Oct. 22, 1980, PCT Pub. No. WO80/01925, PCT Pub. Date Sep. 18, 1980

PCT Filed Mar. 13, 1979, Ser. No. 197,981

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—263 **6 Claims**



1. A spindleless spinning machine, having a framework whereon are disposed a rotation drive, spinning stations each of which comprises a fibres feed unit and a spinning chamber, having a housing which is installed on the framework so that it can be withdrawn from the fibres feed unit, and also a yarn withdrawal unit whose driving shaft is installed on the framework and pressing rollers are in operating position resiliently pressed to the driving shaft and mounted so that they can be withdrawn from said driving shaft, and yarn winding devices, each of which is mounted at a respective spinning station and comprises a bobbin carrier and a yarn spreader, characterized in that each pressing roller **(23)** is mounted on the housing **(14)** of a respective spinning chamber **(5)**, and each yarn winding device **(3)** has an operative connection **(31)** with the housing **(14)** of the respective spinning chamber **(5)** to engage and disengage the rotation drive.

4,351,150

AUXILIARY AIR SYSTEM FOR GAS TURBINE ENGINE

Wallace M. Schulze, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1980, Ser. No. 124,184

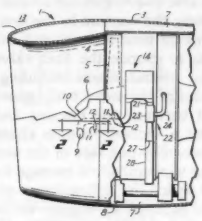
Int. Cl.³ F02K *3/04*; F02C *6/06, 7/20*

U.S. Cl. 60—226 R **4 Claims**

1. An auxiliary air system contained within the engine nacelle between the engine core and the engine cowling of a gas turbine engine and comprising:

(a) an air ducting pipe having one end communicating with an aperture in an external surface of said engine cowling, said aperture lying in a plane generally parallel to the airstream adjacent said aperture;

(b) at least one environmental sensor arranged to sense the condition of air within said pipe;



(c) a structure to be cooled connected to the other end of said air ducting pipe;

(d) an air flow device in communication with said structure to be cooled and effective to move air from the exterior of said cowling through said structure to be cooled, and to said air flow device; and

(e) means for directing air from said air flow device onto selected other engine components.

4,351,151

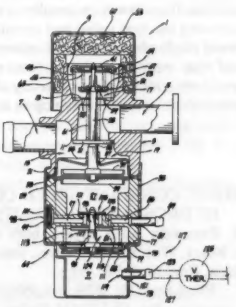
BY-PASS VALVE

James A. McNairy, and John B. Fitzgerald, both of St. Louis, Mo., assignors to ACF Industries, Inc., New York, N.Y.

Continuation of Ser. No. 972,964, Dec. 26, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,110

Int. Cl.³ F01N *3/22*

U.S. Cl. 60—290 **3 Claims**



1. An improved by-pass valve for use in the exhaust system of an internal combustion engine comprising a main body in which is defined an air inlet, first and second air outlets, and air flow paths between the air inlet and the respective air outlets; a first valve normally closing the air flow path between the air inlet and the first air outlet and a second valve normally opening the air flow path between the air inlet and second air outlet; a valve body member located beneath the main body, the upper and lower portions of the main body and the upper and lower portions of the valve body member being hollow; means responsive to engine vacuum for simultaneously opening the first valve and closing the second valve, the vacuum responsive means including a first flexible diaphragm clamped between the main body and the valve body member whereby a first vacuum chamber exposable to engine vacuum is defined

by the diaphragm and the hollow upper portion of the valve body member, a first shaft on which the first and second valves are commonly mounted, one end of the first shaft being secured to the diaphragm for movement therewith; control means responsive to engine vacuum for exposing the first vacuum chamber to engine vacuum, the control means being responsive to abrupt changes in engine vacuum such as occur during engine decelerations for spoiling the vacuum in the first vacuum chamber and causing the vacuum responsive means to reclose the first valve and reopen the second valve, the control means reestablishing the vacuum in the first vacuum chamber after a predetermined time interval and causing the vacuum responsive means to reopen the first valve and reclose the second valve, the control means including a housing fitting over the lower end of the valve body member, a second diaphragm clamped between the housing and the valve body member to define a second vacuum chamber exposable to engine vacuum whereby one side of the second diaphragm is exposed to engine vacuum, a first passage formed in the valve body member by which the hollow lower portion of the valve body member is exposed to engine vacuum, a bleed hole formed in the second diaphragm whereby the vacuum present on the one side of the second diaphragm is communicated to the second vacuum chamber, a second passage formed in the valve body member and extending between the upper and lower hollow portions of the valve body member whereby both the first and second vacuum chambers are simultaneously exposed to engine vacuum, a third passage formed in the valve body member and extending between the upper and lower hollow portions thereof, a second shaft movable within the third passage and having one end connected to the second diaphragm for movement therewith, an air passage formed in the valve body member and having an outlet communicating with the first vacuum chamber, a third valve mounted on one end of the second shaft for opening and closing the outlet of the air passage, a fourth valve mounted on the second shaft intermediate the ends thereof for closing one end of the first passage, and means biasing the second diaphragm to close the third valve and open the fourth valve, the second diaphragm overcoming operation of the bias means upon an abrupt change in engine vacuum to open the third valve and close the fourth valve whereby air is admitted into the first vacuum chamber to spoil the vacuum therein which results in the vacuum responsive means closing the first valve and opening the second valve thus to prevent engine backfires; and, means for overriding the operation of the control means when engine temperature reaches a predetermined value whereby the vacuum responsive means maintains the first valve open and the second valve closed.

4,351,152

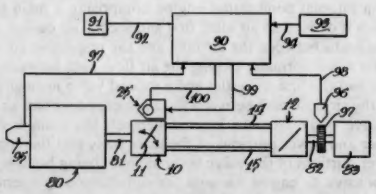
ELECTRONIC CONSTANT SPEED CONTROL FOR A HYDROSTATIC TRANSMISSION

Richard W. Reynolds; Allen Myers, both of Ames, Iowa, and Daniel J. Foley, Westminster, Mass., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 24, 1979, Ser. No. 78,022

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—395 **16 Claims**



1. An electronic constant speed control in combination with a hydrostatic transmission having a variable displacement hydraulic pump with a displacement controlling member movable to various positions at either side of a neutral position and having an input shaft connectable to a prime mover and a hydraulic motor having an output shaft comprising, an electric controller for positioning said displacement controlling member, means for establishing a set constant speed signal representing a desired constant speed between zero and maximum speed in either direction of rotation for said output shaft, means for establishing a pump input shaft speed signal, means responsive to said constant speed and pump input shaft speed signals for generating a position control signal representing the required position of said displacement controlling member for the set speed, means for establishing an output shaft speed signal, means for comparing said output shaft speed signal with said set constant speed signal and integrating any error therebetween and generating a speed error control signal, and means for summing said position and speed error control signals to provide a control signal to said electric controller.

4,351,153

HYDRAULIC CONTROL DEVICE

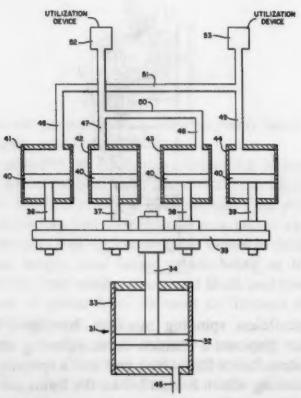
Rupert M. Kosmala, 76, Sutton Rd., London N10 1HG, England

Continuation of Ser. No. 771,355, Feb. 23, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,768

Claims priority, application United Kingdom, Mar. 5, 1976, 9041/76

Int. Cl.³ F01B *7/00*; F15B *7/00, 15/18*

U.S. Cl. 60—581 **5 Claims**



1. A hydraulic fluid dispensing arrangement for dispensing predetermined volumetric quantities of fluid comprising a plurality of pairs of associated pistons and cylinders, each cylinder having a single fluid outlet, means mechanically coupling the pistons together, means for actuating the coupling means to produce a similar degree of motion of the pistons in their respective cylinders, said actuating means comprising a further piston acting in a main cylinder, and means for applying pressurized fluid to the main cylinder to move said further piston, said coupling means including a coupling member secured by a driving rod to said further piston, each pair of associated pistons respectively being coupled to the coupling member in symmetrically balanced relationship with respect to the driving rod, each pair of associated cylinders respectively having their fluid outlets combined, each of said combined outlets being separate from any other combined outlets and applied to a separate utilization device, whereby the forces acting on the coupling member upon operation of the actuating means are symmetrically balanced with resepct to said driving rod.

4,351,154

FEED OF THE EXHAUST GASES FROM AN INTERNAL-COMBUSTION ENGINE TO THE ROTOR OF A CENTRIPETAL TURBINE OF AN EXHAUST GAS TURBOCHARGER

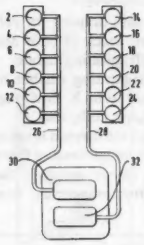
Helmuth Richter, Celle-Boge, Fed. Rep. of Germany, assignor to Aktiengesellschaft Mühnle, Kopp & Kausch, Frankenthal, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,642

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849924

Int. Cl.³ F02B *37/00*; F01D *9/04*

U.S. Cl. 60—605 4 Claims



1. Feed for exhaust gases from multicylinder internal-combustion engine to a rotor of a centripetal turbine of an exhaust gas turbocharger, the turbine having a housing formed with three adjacent outlets radially leading to the rotor, and two inlets disposed above one another and extending in a direction perpendicular to the axis of the housing, two exhaust gas lines of the engine being connected to the two inlets, respectively, a first one of the exhaust gas lines being connected to substantially half of the cylinders of the engine, and a second one of the exhaust gas lines being connected to the other half substantially of the cylinders of the engine, comprising two branch lines branching from the second exhaust gas line; the first exhaust gas line being connected to the middle outlet of the three adjacent outlets, and said two branch lines being connected to the two outer outlets of said three adjacent outlets at the inlet to the rotor; said two branch lines and said two outlets connected thereto extending in direction of the axis of the rotor, at the inlet to the rotor, and being, respectively, disposed adjacent the first exhaust gas line and the middle outlet, respectively; said three adjacent outlets extending in common over the circumference of the rotor.

4,351,155

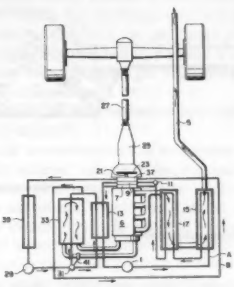
WASTE HEAT RECOVERY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Forest L. Anderson, 12186 Melody Dr., #103, Denver, Colo. 80234, and Robert H. Nation, 13164 Elk Pl., Denver, Colo. 80239

Filed Nov. 7, 1980, Ser. No. 204,855

Int. Cl.³ F01K *23/10*

U.S. Cl. 60—618 22 Claims



1. A method primarily intended for recovering and utilizing waste heat from the exhaust and coolant of an internal combustion engine by using two separate and closed circuits of working fluid, said method comprising the steps of:

(a) pumping a liquified, first working fluid to a first location along a first closed circuit,

(b) vaporizing said first working fluid at said first location along said first circuit to a high side temperature and pressure by applying waste heat from said exhaust,

(c) expanding said vaporized first working fluid in said first circuit to produce work,

(d) condensing said expanded first working fluid to a liquid state by removing heat therefrom,

(e) repeating steps (a)–(d) while simultaneously,

(f) pumping a liquified, second working fluid along a second closed circuit,

(g) vaporizing said second working fluid at at least one location along said second circuit to a high side temperature and pressure less than the high side temperature and pressure of said first circuit by selectively applying waste heat from said coolant and the removed heat of step (d),

(h) expanding said vaporized working fluid in said second circuit to produce work,

(i) condensing said expanded second working fluid to a liquid state, and

(j) repeating steps (f)–(i).

4,351,156

COMBUSTION SYSTEMS

David J. White, San Diego, and Peter B. Roberts, Encinitas, both of Calif., assignors to International Harvester Company, Chicago, Ill.

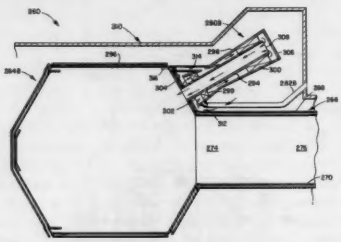
Division of Ser. No. 930,249, Aug. 2, 1978. This application Jan. 9, 1980, Ser. No. 110,784

Int. Cl.³ F02C *7/224*; F23R *3/32*

U.S. Cl. 60—737 7 Claims

1. Combustion apparatus of the premix/fuel lean type, comprising: means providing an annular array of primary combustion zones of circular cross section and independently activatable means for so introducing jets of a premixed combination of fuel and primary air having an equivalence ratio of less than unity into each of said primary combustion zones at intervals therearound and toward the axial centerline of the primary combustion zone at the upstream end thereof as to effect recirculation of fluid in the primary combustion zone at a volume rate exceeding that at which the fuel and air are introduced

into the primary combustion zone, whereby the temperature and the concentration of oxygen in said main primary combustion zone can be kept at levels that inhibit the formation of NO_x; and means providing an annular secondary combustion zone downstream from and communicating with all of said primary combustion zones, whereby the output of said apparatus can be varied to accommodate the load thereon by varying the number of primary combustion zones which are operational, the means providing said secondary combustion zone



comprising concentric inner and outer liners and a closure means spanning said liners at the upstream end of said secondary combustion zone, said primary combustion zones being communicated with said secondary combustion zones through said closure means and the diameter of each said primary zone being greater than the radial dimension of the secondary combustion zone, whereby there is a step between each said primary zone and the secondary combustion zone at the location where those zones communicate with each other.

4,351,157

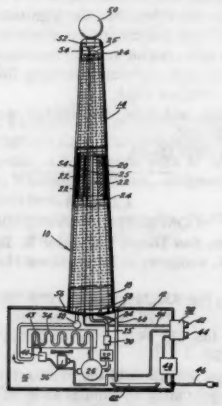
METHOD AND APPARATUS FOR FORMING ICE SCULPTURES OR THE LIKE

Andy W. Zeigler, Pine Acres, Milford, Pa. 18337

Continuation of Ser. No. 29,232, Apr. 11, 1979, abandoned. This application Feb. 25, 1981, Ser. No. 238,053

Int. Cl.³ F25C *1/00*

U.S. Cl. 62—1 **16 Claims**



1. An apparatus for forming ice sculptures and the like, comprising:

a housing;

a helical stack of pipe coils forming a continuous composite surface of predetermined shape, disposed on said housing and fully exposed to the ambient atmosphere;

means disposed in said housing for refrigerating said helical stack of coils, said stack of coils also forming evaporator means for the refrigerating means; and,

a substantial layer of ice formed upon operation of the refrigerating means, from successive layers of frost on substantially all of said surface in said predetermined shape, the layer of ice formed only from moisture condensed from the ambient atmosphere.

2. An apparatus for forming ice sculptures and the like comprising:

a housing;

a helical stack of pipe coils forming a continuous composite surface of predetermined shape, disposed on said housing;

a sleeve member formed from highly thermally conductive material overfitting said helical stack of coils and in substantial surface contact therewith, said sleeve member providing an outer ice-forming surface fully exposed to the ambient atmosphere;

means disposed in said housing for refrigerating said helical stack of coils, said stack of coils also forming evaporator means for the refrigerating means;

said means for refrigerating further including a circulating refrigerating fluid which flows upwardly through the helical stack of pipe coils; and

a substantial layer of ice formed upon operation of the refrigerating means, from successive layers of frost on substantially all of said sleeve member, the layer of ice formed only from moisture condensed from the ambient atmosphere.

4,351,158

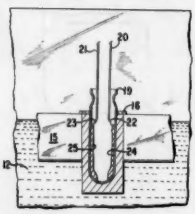
METHOD OF PRODUCING MULTICOMPONENT LYOPHILIZED PRODUCT

Arthur Hurwitz; John Michelucci, both of Plattsburgh, N.Y., and John Krupey, Montreal, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 22, 1980, Ser. No. 114,151

Int. Cl.³ B65B *63/08*

U.S. Cl. 62—60 **9 Claims**



1. A process for obtaining a package containing a mass of dry matter comprising at least two immunologic reagent materials incompatible with each other in the presence of moisture which comprises the steps of simultaneously charging separate aqueous liquid compositions of each material into a container maintained at a temperature substantially below the freezing temperature of each of said first and second liquid compositions in such predetermined amounts that the separate charges of liquid compositions freeze on the wall of said container, and then simultaneously lyophilizing the frozen masses.

4,351,159

ENERGY RECOVERY SYSTEM

Frank A. Schumacher, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

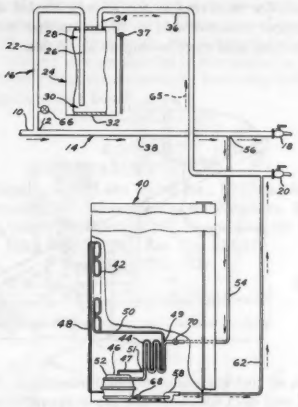
Filed Mar. 5, 1981, Ser. No. 240,750

Int. Cl.³ F25B *7/00, 27/02*

U.S. Cl. 62—79 **5 Claims**

1. A method of providing auxiliary hot water to a water system including:

(a) conducting water into the system from a water supply,
(b) dividing the incoming water at a junction into a cold water branch and a hot water branch said hot water branch including a hot water heating tank, each branch terminating downstream at a valve,
(c) introducing water to be heated into the bottom of the hot water heating tank and expelling hot water out the top thereof for delivery to the hot water branch valve,



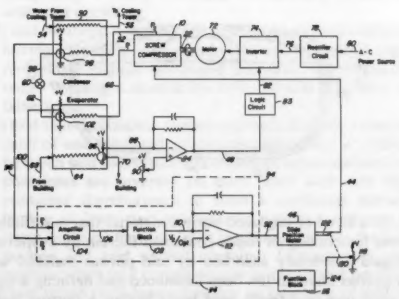
(d) conducting water from the cold water branch to refrigerating apparatus having a condenser, evaporator and compressor, constantly when the refrigerating apparatus is operating,
(e) circulating the water in heat transfer relationship with the condenser to heat the water, and
(f) pumping the heated water from the refrigerating apparatus into the hot water branch between the hot water heating tank and the hot water branch valve when the temperature of the heated water is above 110° F.

4,351,160

CAPACITY CONTROL SYSTEMS FOR SCREW COMPRESSOR BASED WATER CHILLERS

Kenneth J. Kountz, Palatine, Ill., and Richard A. Erth, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 16, 1980, Ser. No. 159,572
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—201 **7 Claims**



1. A control system for a helical rotary screw compressor employed in a refrigeration apparatus having a condenser, an expansion device and an evaporator connected in a closed refrigeration circuit with the screw compressor, the refrigeration apparatus also including capacity varying means for varying the capacity of the screw compressor, comprising in combination:

said screw compressor compressing gas from a low pressure at suction to a high pressure at discharge and including a housing with a barrel portion having a pair of parallel intersecting bores, an inlet port and a discharge port, two intermeshed helical rotors disposed in said bores and forming variable volume compression chambers, an axially extending recess disposed within said barrel portion in open communication with said bores, and a slide valve member being axially slidable in said recess between a first position in which the discharge port is fully opened and a second position in which the discharge port is closed;

first circuit means connected to provide a control signal to the capacity varying means for regulating the capacity of said screw compressor;

a slide positioning motor mechanically coupled to drive said slide valve member;

second circuit means connected to provide a signal representing the optimal volume of gas trapped in the compression chamber prior to discharge as a function of the pressure ratio across said screw compressor; and

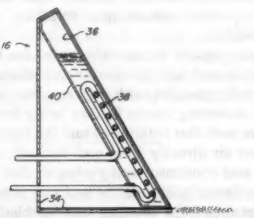
third circuit means, responsive to said second circuit means, connected to provide an error signal to said positioning motor for regulating the position of said slide valve member so as to adjust the actual volume of gas trapped in the compression chamber prior to discharge.

4,351,161

METHOD AND APPARATUS FOR USING SOLAR ENERGY TO AUGMENT A REFRIGERANT HEATING AND COOLING SYSTEM

Richard D. Jones, Denver, Colo., assignor to Solar Energy of Colorado, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 359,283, Dec. 12, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,981
Int. Cl.³ F25B *27/00*; G05D *23/00*
U.S. Cl. 62—235.1 **5 Claims**



1. An apparatus for supplying heat within a building, wherein the apparatus includes a heat exchanger in the building, a refrigerant circuit including a refrigerant gas compressor for delivering a relatively hot compressed refrigerant gas to the heat exchanger for circulation therethrough to transfer heat from the refrigerant gas for utilization within the building thereby cooling and condensing the gas to liquid refrigerant, a sub-ambient heat collector in said refrigerant circuit to exchange heat between radiant energy or ambient air and liquid refrigerant delivered to the collector for evaporation in the collector and return of relatively cold gas to said compressor, the improvement in said sub-ambient collector comprising:

a closed, free-standing uninsulated tank mounted in ambient air, said tank having first and second spaced sides interconnected by end walls, at least said first side wall being a collector plate for absorbing radiant heat and both of said side walls being exposed to the free flow of ambient air for absorbing heat by convection from the ambient air contacting substantially the entire outer surface of each of said side walls;

a refrigerant expansion coil in said tank connected in said

refrigerant circuit to transfer heat from said collector to the liquid refrigerant;

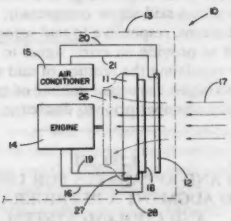
a mass of water and/or ice substantially filling the remaining space between said side walls and said coil to immerse said coil in said mass, said mass being in continuous surface contact with said collector plate and said second side wall to freely exchange heat with said collector plate and said second side wall and ambient air by conduction and to continuously transfer thermal energy by conduction through said mass to said refrigerant coil.

4,351,162

APPARATUS FOR ENGINE COOLING AND VEHICLE AIR CONDITIONING

Clifford S. L. Yee, Indianapolis, Ind., assignor to Wallace Murray Corp., Indianapolis, Ind.

Filed Oct. 1, 1980, Ser. No. 192,893
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—239 **14 Claims**



1. An apparatus for cooling a vehicle engine and for air conditioning the vehicle, which comprises:

a planar liquid-coolant radiator mounted in the vehicle and operatively connected with the vehicle engine;

a planar condenser with the air conditioning unit of the vehicle, said radiator and said condenser being in substantially parallel, spaced apart relation;

a fan blade;

mounting means for mounting said fan blade between said radiator and said condenser and rotatable in a plane substantially parallel with said radiator and said condenser, said mounting means further being for mounting said fan blade such that rotation of said fan blade in a first direction draws air directly from and through one of said radiator and said condensor and pushes air directly to and through the other of said radiator and said condensor; and

rotation means for rotating said fan blade in the first direction to draw air directly from and through one of said radiator and condensor and to push air directly through the other of said radiator and said condenser.

4,351,163

AIR CONDUCTING MECHANISM

Donald L. Johannsen, 3742 W. Solar Dr., Phoenix, Ariz. 85021

Division of Ser. No. 168,655, Jul. 11, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 317,463
Int. Cl.³ F28D *5/00*
U.S. Cl. 62—305 **5 Claims**

1. An air conditioning system comprising in combination:

(a) a refrigeration unit having an air outlet and a condenser coil;

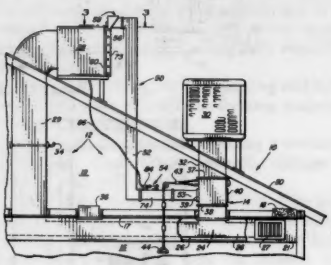
(b) an evaporative cooler having an air outlet;

(c) means connecting the air outlet of said refrigeration unit to a first point of use;

(d) an air diversion duct connecting the air outlet of said evaporative cooler to the first point of use and to a second point of use, said air diversion duct including damper means having a first position for directing evaporatively cooled air to the first point of use and a second position for directing that air to a second point of use; and

(e) an air conducting mechanism connected between said refrigeration unit and said air diversion duct for delivering evaporatively cooled air to the condenser coil of said refrigeration unit when the damper means of said air diversion duct is in its second position, said air conducting mechanism including,

I. a duct having an air inlet connected to said air diversion duct for receiving evaporatively cooled air when the damper means of said air diversion duct is in its second position, said duct having an air outlet,



II. an air distribution manifold connected to the air outlet of said duct for receiving the evaporatively cooled air therefrom, said air distribution manifold mounted adjacent the condenser coil of said refrigeration unit for distributing the evaporatively cooled air across the air inlet face of the condenser coil,

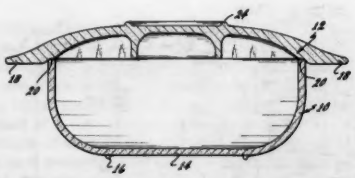
III. damper means in said duct and connected to be responsive to the operation of said refrigeration unit for delivering the evaporatively cooled air to said refrigeration unit when it is operating and venting the evaporatively cooled air to the second point of use when said refrigeration unit is inoperative.

4,351,164

POROUS SALAD BOWL INCLUDING RIBBED LID FOR COOLING

Peter Christiani, 145 S. Western Ave., Apt. 121, Anaheim, Calif. 92804

Continuation of Ser. No. 112,163, Jan. 14, 1980, abandoned. This application May 8, 1981, Ser. No. 261,907
Int. Cl.³ F25D *1/00*
U.S. Cl. 62—315 **1 Claim**



1. In a bowl of unglazed porous material that is sufficiently porous for cooling of foods contained therein by evaporation of liquid previously absorbed by said porous material when said porous material has been moistened and defining a cavity for receiving said foods, said bowl having a bottom and an upper rim and including a unitary dished lid of said porous material having a concave side and a convex side, the improvement comprising:

ribs integral with and extending upwardly from said concave side of said lid and dividing said concave side into a

plurality of serving compartments, said ribs also increasing the total surface area of said concave side relative to the surface area of said convex side to thereby increase the rate of evaporation of said liquid from said lid to thus improve the cooling of said foods, said convex side being of shallow curvature relative to said bowl cavity so that said lid may be inverted on said rim without substantially extending into said bowl cavity,

such that said lid may be inverted on said rim between a concave side down position and a concave side up position for selecting a higher or a lower rate of evaporative cooling of said covered foods, and when placed with said ribbed, concave side up said lid is also useful as a chilled serving tray while simultaneously covering and cooling the contents of said bowl.

4,351,165

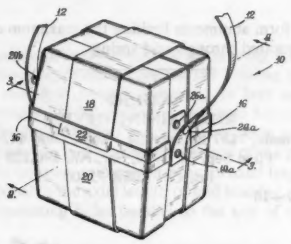
PORTABLE COOLER

Marten Gottsegen, 1212 Lake Shore Dr., Chicago, Ill. 60610; Fred F. Drucker, 205 Riverside La., Lincolnshire, Ill. 60015, and Henry Glass, 245 Dickens Rd., Northfield, Ill. 60093

Filed Jan. 7, 1981, Ser. No. 223,121

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—371 **10 Claims**



1. A portable cooler, comprising in operative combination:

(a) a first, lower insulated container having an outer shell and an inner liner of insulating material, which container consists essentially of four adjoining walls and an integral base defining a volume for carrying items, and being substantially open on a sixth side;

(b) a second, upper insulated container having an outer shell and an inner liner of insulating material, which container consists essentially of four adjoining walls and an integral top defining a volume for carrying items, and being substantially open on a sixth side;

(c) a removable closure for said openings of said containers comprising a liquid container substantially coextensive with said openings;

(d) said insulated liner walls of both said insulated containers having a shoulder defined adjacent said open sixth side to receivingly engage said liquid container, said liquid container forming a closure for either of said insulated containers;

(e) said liquid container extends partially into the volume of each of said insulated containers and defines a separator between said two insulated containers when said insulated containers are inverted on each other with said liquid container therebetween to form a combined container having at least two substantially separate volumes for items, and said first insulated container forming the lower portion and said second container forming said upper portion when said containers are in the closed position;

(f) said liquid container providing an interlock of said two insulated container portions against relative lateral movement and providing lateral support;

(g) means for releasably securing said liquid container to said second, upper insulated container; and

(h) a carrying strap secured adjacent opposite ends thereof to opposite sides of said first, lower insulated container shell, and having means spaced from the secured ends for releasably attaching the strap to corresponding opposite sides of the second, upper insulated container shell, whereby the portions of the strap between the ends and said reeasably attaching means hold the first and second insulated containers together.

4,351,166

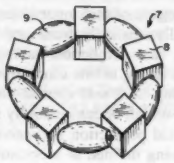
RING

Juliette Belin, 9040 Ft. Hamilton Pkwy., Brooklyn, N.Y. 11209

Filed Nov. 10, 1980, Ser. No. 205,841

Int. Cl.³ A44C *9/00*

U.S. Cl. 63—15 **4 Claims**



1. A finger ring comprising an elastic string which is a closed, circular loop, beads strung on the string so that the beads are disposed along substantially the entire circumference of the loop when the ring is off the finger and the elastic string is in the contracted condition, the loop being of a size such that the ring can be conveniently slipped onto the finger and when in place on the finger the elastic will be extended so that the ring grips the finger and tends to remain in place thereon, wherein at least some of the beads have rounded surfaces so that when the ring is in place on the finger other than the thumb, it will slide circumferentially without jerking when beads having said rounded surfaces are pumped circumferentially with the thumb and wherein one of the beads includes means for causing jerking to occur when said one bead is pumped, said means including square corners on said one bead projecting radially inward and outward of the ring beyond the peripheries of the beads adjacent to said one bead, thereby to engage the skin when said one bead is moved circumferentially.

4,351,167

ELASTIC COUPLING OF DISC CONSTRUCTION

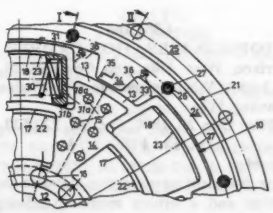
Wolfgang Hanke, and Manfred Schmitt, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith Getriebe KG, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,208

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848748; Sep. 14, 1979, 2937237

Int. Cl.³ F16D *3/80, 3/14*

U.S. Cl. 464—24 **17 Claims**



1. An elastic coupling of disc construction comprising:

a first coupling half comprising a central disc rotatable about an axis;

a second coupling half comprising two side discs arranged on the opposite sides of said central disc; said side discs being connected to each other and being rotationally fixed; said side discs being rotatable with respect to said central disc about an axis; said side discs enclose said central disc at the outer circumference of said side discs, defining an enclosed inner chamber which can be filled with a fluid and which houses said central disc;

elastic coupling elements joining said first and said second coupling halves such that relative rotation of said coupling halves charges said elastic coupling elements, which thereby restrains such relative rotation;

in said inner chamber, a projection being arranged at the radially outer region of said inner chamber and extending generally radially inwardly from and being attached to said side discs; said projection having a first abutment surface thereon facing in one circumferential direction of said one coupling half; said central disc having a recess defined therein which opens generally radially outwardly and in which said projection is received; a second abutment surface being defined at a circumferential side wall of said recess; said first and said second abutment surfaces being shaped and positioned to be in opposition to each other, and at a maximum torsion angle of relative rotation of said coupling halves, said first and said second abutment surfaces being in substantially surface contact;

said discs being dimensioned so that said first and said second abutment surfaces define a radially extending displacement chamber between them, which said displacement chamber is also comprised by said side discs; the volume of said displacement chamber being adapted to vary as said coupling halves counter-rotate, which moves said first and said second abutment surfaces circumferentially with respect to each other;

said discs being shaped to together define a throttle opening for fluid in the vicinity of said projection and between said central disc and said side discs and said throttle opening being defined by said throttle opening defining surface and said radially outwardly facing wall surface; said throttle opening communicating between said displacement chamber and said inner chamber outside said displacement chamber and being shaped to restrict the flow of fluid through itself to retard relative movement between said central and said side discs.

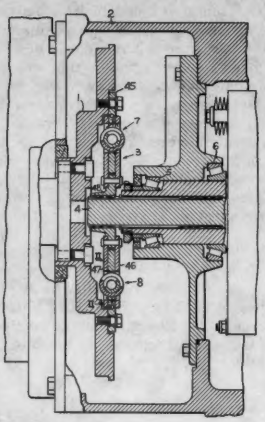
4,351,168

TORSION VIBRATION DAMPER

George T. Prince, West Allis, and Gerardus M. Ballendux, Waukesha, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 29, 1980, Ser. No. 220,520
Int. Cl.³ F16D 3/14
U.S. Cl. 464—64 **10 Claims**

1. A torque transmitting vibration damper comprising, a driving member and a driven member defining angularly spaced spring slots, spring assemblies including at least one spring in each of said slots, a spring seat on each end of said springs for transmitting torque from said driving member to said driven member through said spring assemblies, each of said spring seats having means extending axially within said



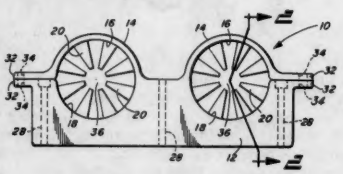
springs to form abutments limiting the maximum compressive force transmitted through said springs.

4,351,169

RESTRAINING DEVICE

Jay F. Plymale, 7437 Birkner Dr., Kent, Ohio 44240

Filed Sep. 24, 1980, Ser. No. 190,229
Int. Cl.³ E05B 75/00
U.S. Cl. 70—16 **5 Claims**



1. A device for restraining a person comprising a base member having a plurality of openings adjacent the top surface thereof, one or more arm members flexibly attached to said base member and having one or more openings adjacent the bottom surface thereof, said one or more openings in said one or more arm members being so positioned therein so as to be complementary to said plurality of openings in said base member to receive the wrists of the person being restrained, and tang members attached to and angularly directed away from the surfaces defining said plurality of openings in said base member and attached to and angularly directed away from the surfaces defining said one or more openings in said one or more arm members, said tang members being engageable with the surface of the wrists of the person being restrained and applying a force thereto.

4,351,170

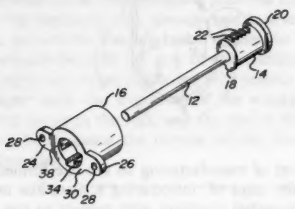
KEY ACTUATED LOCKING BOLT

I. Bertram Clompus, 111 Harvest La., Phoenixville, Pa. 19460

Filed Sep. 2, 1980, Ser. No. 183,528
Int. Cl.³ E05B 65/08
U.S. Cl. 70—90 **8 Claims**

1. A lock for use with first and second frame members of the window or door type having overlapping portions when in the closed position comprising:

(a) a bolt having a length sufficient to extend through the thickness of one of the overlapping frame members and enter a blind hole in the mating overlapping frame members;
(b) a plug fixedly connected to and coaxial with one end of said bolt and having a length substantially shorter than the length of the bolt, a locking lug projecting radially outwardly from the plug adjacent said one end;
(c) a discrete housing adapted to be bolted at one end to an interior side face of one overlapping frame member, said housing having a passage therethrough, said plug being insertable in said passage from the other end of said housing and rotatably supported in said housing passage for rotation between a locked position when the lug engages a mating



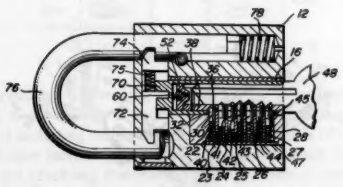
surface adjacent said one end on the housing for prevention of relative reciprocation between the housing and the plug and an unlocked position wherein the bolt and plug are bodily removable from said housing, said housing having a longitudinally extending groove on its inner periphery for accommodating said lug during removal of the plug and bolt from said housing, said plug having an axial length approximately equal to the axial length of said housing, said housing having mounting holes parallel to the axis of said passage; and
(d) key operated tumbler means associated with said plug for facilitating rotation of the plug and bolt relative to said housing between the locked and unlocked positions.

4,351,171

SEQUENTIAL LOCKING TWO KEY LOCK

Yaiman Tsui, Kowloon, Hong Kong, assignor to China National Light Industrial Products Import Export Corporation, Shantung Branch, Taingtao, China

Filed Jul. 1, 1980, Ser. No. 165,226
Int. Cl.³ E05B *35/12*
U.S. Cl. 70—339 **15 Claims**



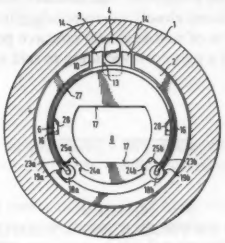
1. A locking apparatus requiring sequential actuation by two different keys for unlocking thereof, comprising:
an inner tubular member having a key slot formed therein;
an intermediate tubular member slidably receiving said inner tubular member;
an outer tubular member slidably receiving said intermediate tubular member;
a plurality of pins extending radially through said outer, intermediate and inner tubular members for contact with a key disposed in said key slot;
a cam member axially movably mounted within said intermediate tubular member;
cam surface means formed on said inner tubular member for causing axial movement of said cam member upon rotation of said inner tubular member;
a first axial slot formed in said intermediate tubular member;
a second axial slot formed in said outer tubular member, said first and second axial slots being registrable with each other; and
a pin extending from said cam member through said first and second axial slots, said pin being moved from a position within said slots to a position out of said slots upon axial movement of said cam member.

4,351,172

CYLINDER LOCK MECHANISM

Kaarlo Martikainen, Mastotie, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Aug. 27, 1980, Ser. No. 181,803
Claims priority, application Finland, Sep. 7, 1979, 792797
Int. Cl.³ E05B *29/02*
U.S. Cl. 70—366 **22 Claims**



1. A key operated cylinder lock including a hollow stationary cylinder housing enclosing a turnable power transmission element and a locking bar having a position locking the turning movement of said power transmission element relative to said cylinder housing, further a set of discs including a number of locking discs turnable by means of combination surfaces on a key of said lock, said locking discs being turnable, by the turning movement of said key, from an initial key insertion position to a releasing position, in which said power transmission element is released from its locked connection to the cylinder housing, the key of the lock being arranged to directly transmit a turning force to a number of locking discs only in a direction from said initial position to said releasing position, the returning of these locking discs to their initial position being arranged to be carried out by means of a separate return bar, receiving turning power from said key through one or several members turning with the key, said lock comprising means for guiding said return bar and said guiding means including means for allowing said return bar to move in the circumferential as well as in the radial direction of said lock.

4,351,173

KEY HOLDER

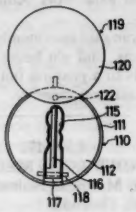
Minoru Toyoda, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 68,568, Aug. 22, 1979. This application Dec. 5, 1980, Ser. No. 213,350
Claims priority, application Japan, Sep. 8, 1978, 53-110845; Feb. 6, 1979, 54-13025; Feb. 6, 1979, 54-13026; Feb. 6, 1979, 54-13027; Feb. 6, 1979, 54-13028; Feb. 6, 1979, 54-13029
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 R **5 Claims**

1. A pendant type key holder comprising:
a body;
a key having serrations, said key being freely, pivotably

mounted on said body and movable between an operating position in which the key is disposed outside said body and a non-operating position in which the key is housed within said body; and

a cover pivotably mounted on said body, the body including a concave portion formed in a surface thereof within



which the key is housed when in the non-operating position, such that the key in the non-operating position is maintained by said cover, said concave portion being of an elongated shape closely corresponding to the outer edge configuration of said key, said concave portion including serrations at a part corresponding to said serrations of said key.

4,351,174

METHOD OF PRODUCING A PROFILE STRIP

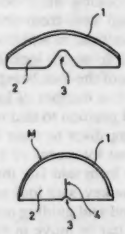
Herbert Bauer, Bad-Liebenzell, and Guenter Weik, Birkenfeld, both of Fed. Rep. of Germany, assignors to INOVAN - Stroebe G.m.b.H. and Co. KG, Birkenfeld, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,197

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, 2944613

Int. Cl.³ B21D *5/00*

U.S. Cl. 72—47 **6 Claims**



1. A method of forming a metal strip for electrical contact members having a raised side uniformly plated with a layer of at least one metal different from the metal of which said strip consists, said method comprising the steps of: plating a flat metal strip on one of its flat sides with a uniform layer of at least one other metal; forming, in a first forming step, a central groove into said metal strip such that said groove extends lengthwise of said metal strip along its underside opposite said plated side and slightly bending said metal strip such that the plated side is slightly curved; and, in a second forming step, folding the flat metal strip together, lengthwise, with said layer on the outer side so as to close said groove and raise the plated side thereby obtaining the desired outside profile on the outside strip surface carrying said layer.

4,351,175

METHOD OF MANUFACTURING AN ARC-LIKE FORMED PRODUCT AND EQUIPMENT FOR CARRYING OUT THE METHOD

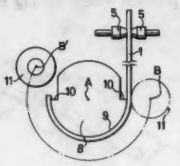
Shigeo Ichikawa; Motonobu Ito, and Makoto Aiba, all of Toyota, Japan, assignors to Taiho Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 16, 1980, Ser. No. 187,980

Claims priority, application Japan, Sep. 22, 1979, 54-122201

Int. Cl.³ B21D *53/10*

U.S. Cl. 72—203 **8 Claims**



1. A method of manufacturing an arc-like formed product comprising the steps of: introducing a plate-like metal strip piece in a tangential direction with respect to one end of a cylindrical forming surface on a forming die and moving a die roller along said cylindrical forming surface, said die roller having its center at a desired distance apart from the center of said forming surface of said forming die whereby said metal strip is rolled in a direction of thickness between said cylindrical forming surface and said die roller and is formed in an arc shape along said cylindrical forming surface of said forming die;

pressing said metal strip formed along said cylindrical forming surface of said forming die against said cylindrical forming surface in a range of at least 1/20 to ⅓ of the length of said forming surface along its peripheral surface measured from both ends of said cylindrical forming surface;

and cutting the metal strip by a cutter portion formed on at least one end of said cylindrical forming surface of said forming die and by a movable blade cooperating with said cutter portion so as to obtain a formed strip piece.

4,351,176

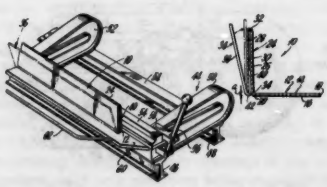
BENDING BRAKE HEMMER

Carl Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306

Filed Apr. 24, 1980, Ser. No. 143,507

Int. Cl.³ B21D *5/04*

U.S. Cl. 72—322 **6 Claims**



1. In a portable bending brake having a workpiece bending door and clamping jaws gripping a bending attachment therein, said bending attachment being positioned in the bending brake adjacent the bending door for the additional bending of a previously partially bent sheet material workpiece, the improvement wherein said attachment is one piece, comprising

a horizontally oriented elongated base section for mounting in the jaws of the conventional portable brake and having a width extending between an elongated free edge and an opposing elongated proximal edge, and a workpiece hold-

ing section vertically upstanding from said base section, said workpiece holding section comprising two fixed elongated opposed parallel legs both substantially perpendicular to said base section and uniformly spaced apart by a dimension substantially less than the width of the base section and approximating the thickness of the workpiece, each of said legs having opposing elongated upper and lower edges, said legs being interconnected at their respective upper edges forming an apex such that said interconnected legs are formed of one continuous piece of sheet material, whereby said legs form a substantially inverted U-shape in cross section for loosely receiving a portion of the workpiece between the legs without clamping the workpiece, the lower edge of one of said legs being interconnected to said elongated proximal edge, with the other leg remaining free, wherein said base section is held in the jaws of the bending brake, so that the holding section extends beyond the grip of the clamping jaws, the holding section being positioned with respect to the bending door such that a portion of the workpiece can be inserted between the legs, and the rest of the workpiece can be bent against the outside of the free leg by the bending door.

4,351,177

APPARATUS FOR MAKING A BEVEL GEAR

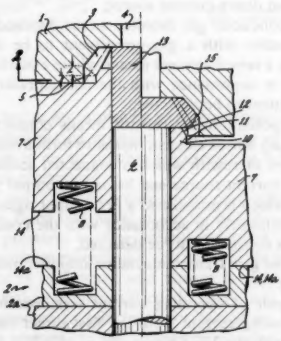
Herbert Leykamm, Lauf, and Siegfried Knabel, Nuremberg, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,796

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927192

Int. Cl.³ B21K *1/30*

U.S. Cl. 72—354 **5 Claims**



1. Apparatus for making bevel gears by pressworking, including a die having a cavity contoured for making a bevel gear and including ridges for forming the grooves of the bevel gear; further including a punch and a counterpunch concentrical to and receiving the punch, the improvement comprising:

means defining an annular extension of the die cavity, resembling a hollow spline shaft including radially inwardly extending ridges which continue the the ridges of the bevel gear cavity;

an annular extension on a front end of the counterpunch, the extension including a cylindrical portion whose diameter is slightly smaller than a diameter defined by a circle along the spline shaft ridges; and

additional contour means on the extension for limiting and controlling material flow in the die cavity when the extension projects into the die cavity.

4,351,178

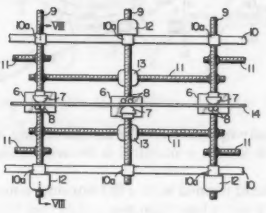
APPARATUS FOR BENDING A STRAIGHT TUBE INTO A SERPENTINE TUBE

Katuharu Uehara, and Izumi Ochiai, both of Ohiramachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 62,993, Aug. 2, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,840

Int. Cl.³ B21D *7/02, 31/00*

U.S. Cl. 72—383 **1 Claim**



1. Apparatus for producing a serpentine tube for use with a heat exchanger or the like by bending a straight tube comprising:

bending head means movable both longitudinally and transversely for forming bends in the straight tube; and

drive means for moving said bending head means longitudinally and transversely;

motor means associated with said drive means to drive dies in the direction of a center axis of the straight tube and, at the same time, in a direction intersecting said axis at a different speed,

wherein the improvement resides in that said bending head means comprises

a fixed die provided with an arcuate surface for forming a bent portion of the serpentine tube by bending the straight tube, and

a pair of wings associated with said fixed die to hold the straight tube between the die and the two wings and push the tube to the arcuate surface of the die during a bending operation, said two wings moving symmetrically to right and left respectively from the apex of the arcuate surface to said die, and

means actuating both of said two wings to rotate 90° against and around the arcuate surface of each die for effecting bending of said serpentine tube without producing excess material by maintaining a dimensional relationship between the straight tube and the serpentine tube which satisfies following equation:

$$\overline{PQ} = \frac{L}{2} + \pi R\left(\frac{90 - \theta}{180}\right)$$

where:

$\overline{PQ}$: half length of straight tube portion during a bending operation of the tube;

L: length of straight portion on completion of bending operation;

R: the radius of bent portion of tube;

θ: bending angle of bent portion of tube.

4,351,179

MANUAL RIVETING TOOL

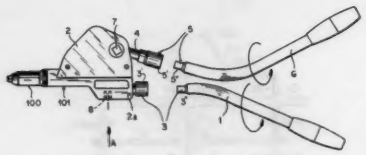
Josef Fiebiger, Dingolfing, Fed. Rep. of Germany, assignor to Gesipa Blindniettechnik Gesellschaft mit Beschränkter Haftung, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,615

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 7823317[U]; Aug. 4, 1978, 2834160

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—391 **5 Claims**



1. A manually operable riveter for the setting of blind rivets of the type in which a mandrel is drawn through the rivet, comprising:

a riveting head formed with a flat housing, a mandrel-engaging chuck extending from one end of said housing, a rotatable member operatively coupled to said chuck for displacing same, and a pair of actuating members at an opposite end of said housing and adapted to form a pair of tongs, one of said actuating members being connected to said rotatable member for driving same;

respective arms each removably connectable to a respective one of said actuating members to form said tongs therewith, each arm having a first element and each actuating member a second element of a respective two-element detachable joint;

and

means on said housing spaced from the other of said actuating members forming a second element of a detachable joint adapted to receive the first element of one of said arms.

4,351,180

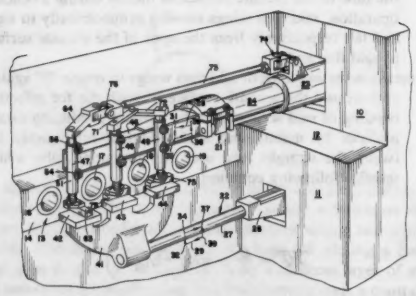
WORKPIECE TURNING TRANSFER

Gene E. Allebach, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Jun. 30, 1980, Ser. No. 164,774

Int. Cl.³ B21D *43/10*

U.S. Cl. 72—405 **20 Claims**



1. A forging machine transfer for transferring elongated workpieces between two work stations comprising a pair of grippers operable to close and grip a workpiece at one work station and to move in a transfer direction with a gripped workpiece to another work station, one of said grippers being pivoted to rotate said workpiece about an axis which is not parallel to the length of said gripped workpiece, and drive means connected to rotate said one gripper in response to movement in said transfer direction between said work stations, the other of said grippers being free of drive means and not permitting rotation thereof, said drive means providing a linkage including an arm on said one gripper and a drag link connected at one end to said arm and at its other end to a frame member fixed against movement in said transfer direction.

4,351,181

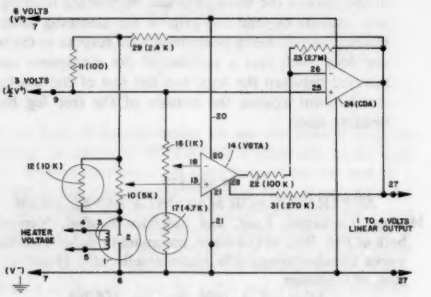
LINEAR, GAS TO VOLTAGE TRANSDUCER CIRCUIT

James H. Currans, 4089 W. Chenango Ave., Littleton, Colo. 80123

Filed Oct. 17, 1980, Ser. No. 198,117

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—23 **10 Claims**



1. In a gas detector circuit having a gas sensor of the semiconductor type, wherein the improvement in said circuit comprises:

(a) first direct current source having a common;

(b) second direct current source;

(c) semiconductor gas detector means disposed in gas communication with a gas constituent to be detected and having a sensor element means whose electrical resistance varies in accordance with the concentration of the gas constituent to be detected;

(d) first potentiometer resistor means connected in series with said sensor element means to form a voltage divider network therewith which is connected across the second direct current source and having an output wiper means upon which is established a first output signal which varies non-linearly in accordance with the concentration of the gas constituent to be detected;

(e) variable gain transconductance amplifier means (VGTA) having:

(1) a pair of operating current terminals for supplying operating current from the first direct current source through the VGTA,

(2) a non-inverting signal input terminal for receiving the first output signal from the wiper means of the first potentiometer resistor,

(3) an inverting signal input terminal for receiving an input signal from a second potentiometer resistor,

(4) a terminal for receiving a biasing current from the output voltage of a conventional differential amplifier (CDA) via a first feedback control resistor and thereby controlling the degree of amplification of said VGTA,

(5) an output terminal for impressing a second output signal emanating from the VGTA and going to the CDA via a first gain control resistor;

(f) first gain control resistor connected in series with a second feedback control resistor between the VGTA and the second feedback control resistor;

(g) second potentiometer resistor which is series connected between the second direct current source and the com-

mon and having a wiper connected to the inverting signal input terminal of the VGTA;

(h) conventional differential amplifier (CDA) means having:

(1) a pair of operating current terminals for supplying operating current from the first direct current source through the CDA,

(2) a non-inverting signal input terminal connected to the second direct current source,

(3) an inverting signal input terminal connected between the first gain control resistor and the second feedback control resistor,

(4) an output terminal for impressing a third output signal emanating from the CDA which subsequently drives an external operation performing component.

4,351,182

OXYGEN SENSOR FOR MONITORING EXHAUST GASES

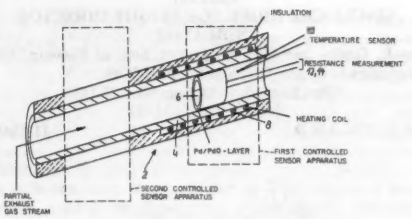
Rainer Schmidberger, Bermatingen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 134,123

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916178

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—27 R **12 Claims**



1. Sensing means for furnishing an output signal indicative of a predetermined partial pressure of oxygen in exhaust gases corresponding to an air number (λ) exceeding 1 ($\lambda > 1$), said sensing means comprising

a layer of metal changing state to the corresponding metal oxide or from said metal oxide to said metal at partial oxygen pressures varying in dependence on temperature for air numbers exceeding 1, said metal oxide having a low solubility in said metal, said change in state causing an abrupt change in electrical conductivity; and

means connected to said layer for furnishing said output signal in response to said change in electrical conductivity.

4,351,183

APPARATUS AND METHOD FOR DETERMINING THE OSMOLARITY/SPECIFIC GRAVITY OF A SOLUTION

Bill R. Egbert, Rte. 5, P.O. Box 338, Blackfoot, Id. 83221

Filed Oct. 31, 1980, Ser. No. 202,408

Int. Cl.³ G01N *9/00, 13/04*

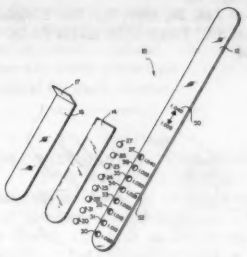
U.S. Cl. 73—32 R **10 Claims**

1. An apparatus for determining the specific gravity or osmolarity of a sample solution comprising:

support means;

a plurality of test solutions, each test solution having a known and predetermined specific gravity; and

semipermeable membrane means for sealingly enclosing each of the test solutions on the support means so that reaction of a test solution with a constituent of the sample solution in the area enclosed within the semipermeable



membrane indicates that osmotic diffusion has occurred through the semipermeable membrane.

4,351,184

SURFACE INSPECTION EQUIPMENT

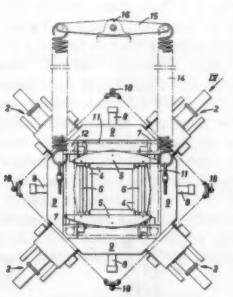
Henry C. Garner, Mexborough, and Jack Broadbent, Rotherham, both of England, assignors to British Steel Corporation, England

Filed Jan. 21, 1981, Ser. No. 226,639

Claims priority, application United Kingdom, Feb. 14, 1980, 8005034

Int. Cl.³ G01N *19/08*

U.S. Cl. 73—104 **9 Claims**



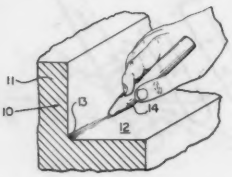
1. Apparatus for inspecting a corner surface of an elongate metallic object of generally rectangular or square cross-section comprising; a rigid assembly having an entry roller box, the entry roller box comprising several rollers movable collectively into contact with flat surfaces of an object to be inspected as it enters the entry roller box to locate the assembly positively with respect to the object; a scanning head having a surface inspection probe, said scanning head supported for movement about the path to be taken by the object under inspection such that, when said rollers are moved into contact with the flat surfaces of said object, a surface inspection probe of the scanning head is sited opposite a corner of the object; and, spring means suspendingly supporting the assembly so as to facilitate movement of the assembly about the path of the object under inspection.

4,351,185

HIGH TEMPERATURE PENETRANT SYSTEM

Vilma A. Garcia, Westchester, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Jan. 26, 1981, Ser. No. 228,604
Int. Cl.[3] G01B 5/28; G01N 19/08
U.S. Cl. 73—104 7 Claims



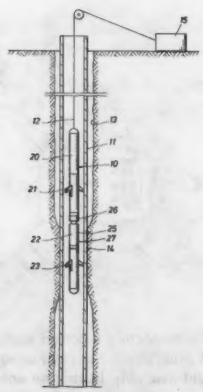
1. A method for the non-destructive testing of a workpiece for surface flaws at an elevated temperature which comprises marking areas of said workpiece with a crayon comprising a carrier which melts at a temperature below said elevated temperature having dissolved therein a dye which is liquid at said temperature and is contrastingly visible to said workpiece at said elevated temperature, and applying a developer at said elevated temperature to the marked areas to thereby draw up dye which has been lodged in surface flaws, and inspecting the workpiece.

4,351,186

APPARATUS FOR CONDUIT FREE-POINT DETECTION IN BOREHOLES

Pierre A. Moulin, Chaville, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Apr. 27, 1981, Ser. No. 258,218
Claims priority, application France, Apr. 30, 1980, 80 09751
Int. Cl.[3] E21B 47/00
U.S. Cl. 73—151 14 Claims



1. In an apparatus for detecting the free point of a conduit in a borehole, the apparatus including a detector body adapted to be suspended from a cable and having at least two parts longitudinally and angularly movably mounted with respect to each other, and means for anchoring each of the parts inside the conduit under control from the surface, an improved detection means for respectively detecting the relative angular and longitudinal movements between the body parts when the conduit is deformed under torsion and tension stresses applied to it from the surface, said improved detection means comprising: a first transformer having a primary winding including a radial core attached to a first part of the detector body, said radial core having a radial axis perpendicular to the longitudinal axis of the detector body, and a secondary winding including two radial coils attached to the second part of the detector body and placed on opposite sides of the coil of the primary for furnishing a first electric signal representative of just the relative angular movement of said parts.

3. In an apparatus for detecting the free point of a conduit in a borehole, the apparatus including a detector body adapted to be suspended from a cable and having at least two parts longitudinally and angularly movably mounted with respect to each other, and means for anchoring each of the parts inside the conduit under control from the surface, an improved detection means for respectively detecting the relative angular and longitudinal movements between the body parts when the conduit is deformed under torsion and tension stresses applied to it from the surface, said improved detection means comprising:

(a) a first radial-coil transformer having a primary winding attached to a first part of the body member and a secondary winding attached to the second part of the body member for furnishing a first electric signal representative of just the relative angular movement of said parts, and

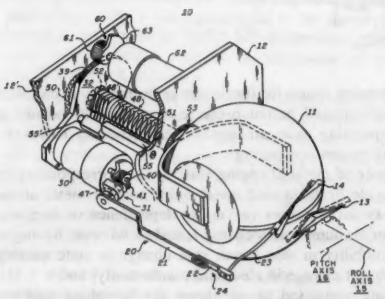
(b) a second axial-coil transformer having a primary winding attached to one part of the body member and a secondary winding attached to another part of the body member for furnishing a second electric signal representative of just the relative longitudinal movement of said parts.

4,351,187

SINGLE CUE DRIVE FOR FLIGHT DIRECTOR INDICATOR

Alan L. Foulks, and Gary O. Larson, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,118
Int. Cl.[3] G01C 21/00
U.S. Cl. 73—178 R 11 Claims



1. An indicating instrument for aircraft having a support housing and a single indicator element adapted to be displaced about roll and pitch command axes relative to a reference index in response to roll and pitch command signals comprising,

a sector gear means supported in said housing for rotation about said roll axis and a roll servomotor supported in said housing having an output for rotating said sector gear about said roll axis in response to said roll signals,

a pitch servomotor mounted on said sector gear having an output shaft extending therefrom in a direction substantially parallel to said roll axis and radially displaced therefrom and responsive to said pitch signals,

an elongated arm means supporting said indicator element, and

means for supporting said arm means on said pitch servomotor for pivotal movement about said pitch axis and includ-

ing right angle drive means coupled between said output shaft and said arm means.

4,351,188

METHOD AND APPARATUS FOR REMOTE MEASUREMENT OF WIND DIRECTION AND SPEED IN THE ATMOSPHERE

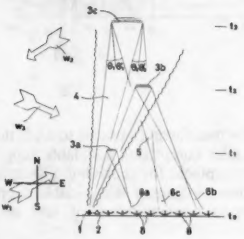
Madoka Fukushima, Tokyo; Kin-ichiro Akita, Sayama, and Yoshihisa Masuda, Musashino, all of Japan, assignors to Radio Research Laboratories, Ministry of Posts and Telecommunications, Koganei, Japan

Filed May 28, 1981, Ser. No. 268,107

Claims priority, application Japan, May 30, 1980, 55/71448

Int. Cl.³ G01W *1/02, 1/00;* G01S *13/00*

U.S. Cl. 73—189 **11 Claims**



1. A method for the measurement of wind direction and speed at high altitudes in the atmosphere, comprising the steps of transmitting vertically into the atmosphere a pulse of acoustic waves from an acoustic wave source installed on the ground thereby causing the pulse of acoustic wave to produce spherical wavefronts, transmitting continuous radio waves from a radio wave source installed on the ground toward the spherical wavefronts thereby enabling the radio waves to be reflected by the spherical wavefronts, detecting the position of the reflected radio waves formed as a focusing spot on the ground, tracing the time-course change of the positions of maximum intensity of the focusing spot of the reflected radio waves, and calculating the height distribution of wind direction and speed in the atmospheric region based on the time-course change of the position of the focusing spot.

4,351,189

DIFFERENTIAL FLOWMETERS

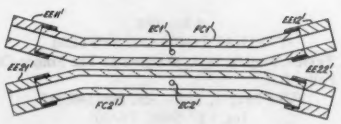
John O. Gray, Wilmslow, and Michael L. Sanderson, Stockport, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 12, 1980, Ser. No. 177,392

Claims priority, application United Kingdom, Aug. 17, 1979, 7928804

Int. Cl.³ G01F *1/58*

U.S. Cl. 73—196 **12 Claims**



1. An electromagnetic flowmeter head having a structure of separate liquid flow channels and measuring electrodes the head structure including in inert, non-magnetic insulating material two pairs of inlet and outlet ports linked by respective channel walls providing substantially identical liquid flow channels held close together with a path for magnetic flux across the channels, each of said inlet and outlet ports having an individual earthing electrode outside the flux path position and each of said channels having a single pick-up electrode of a substantially non-magnetic substance extending through the channel wall to the channel periphery, a pick-up electrode of a said channel providing a first electrode connection circuit terminal and the earthing electrodes of the inlet and outlet ports of the said channel providing in common a second electrode connection circuit terminal, whereby in operation an earth-loop free electrode connection circuit is available substantially identical for each channel.

4,351,190

ULTRASONIC NON-DESTRUCTIVE TESTING DEVICE FOR WELDING BEADS

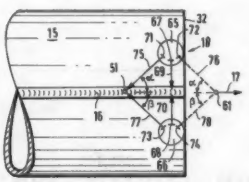
Wilfried Rehme, Brunnenweg 11, D-5200 Siegburg-Braschoss, Fed. Rep. of Germany; Anatoly Stipura, U1 Kirova 9; Victor Ripnyi, Pr Pravdi 113, both of Dnepropetrovsk, U.S.S.R.; Leonid Donskoi, U1 Argunovskaja 12, and Nikolai Schevtschenko, Pr Mira 188, both of Moscow, U.S.S.R.

PCT No. PCT/DE79/00105, § 371 Date May 13, 1980, § 102(e) Date May 13, 1980, PCT Pub. No. WO80/00616, PCT Pub. Date Apr. 3, 1980

PCT Filed Sep. 11, 1979, Ser. No. 231,134

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—638 **6 Claims**



1. An ultrasonic non-destructive testing apparatus for welded seams on tubes comprising: a pair of test transducers for longitudinal defects; first and second pairs of test transducers for transverse defects, each said transverse defect transducer pair having a first element disposed on a first side of said welded seam and a second element disposed on a second side of said welded seam, said first transverse defect transducer pair directing ultrasonic rays at an acute angle to said welded seam intersecting said welded seam at a point on a first side of said longitudinal defect transducer pair, said second transverse defect transducer pair directing ultrasonic rays at an acute angle to said welded seam intersecting said welded seam at a point on a second side of said longitudinal defect transducer pair; and all transducer elements on said first side of said welded seam being mounted close together on a first testing aggregate and all transducer elements on said second side of said welded seam being mounted close together on a second testing aggregate.

4,351,191

PRESSURE SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,700

Int. Cl.³ G01L *9/14*

U.S. Cl. 73—728 **8 Claims**

1. A pressure sensor comprising:

a casing defining an inner space;

a movable body which divides the inner space of said casing into a first space and a second space, a pneumatic pressure to be determined being introduced into the first space;

a spring for urging the movable body in a direction opposite to the pneumatic pressure;

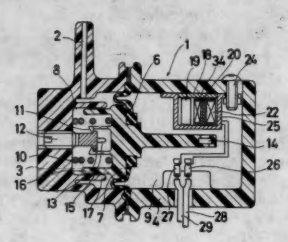
a ferromagnetic member coupled to the movable body;

a permanent magnet for producing a magnetic field;

core means of a magnetically soft material both disposed adjacent to a region of movement of the ferromagnetic member for forming a magnetic circuit therewith;

at least one electrical coil disposed on the core; and

detection means for detecting a change of intensity of magnetic flux produced in said core by the magnetic field of



said permanent magnet means in response to a displacement of said ferromagnetic member, comprising

means for applying a pulse voltage to said electrical coil, and

means for measuring the time delay occurring from the application of said pulse voltage until saturation of said core.

4,351,192

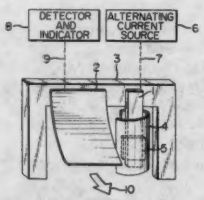
FLUID FLOW VELOCITY SENSOR USING A PIEZOELECTRIC ELEMENT

Minoru Toda, and Susumu Osaka, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1980, Ser. No. 215,000

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.18 **1 Claim**



1. In combination,

a first piezoelectric element driven from a source of alternating current to propagate an acoustic vibration of a frequency determined according to the frequency of said source,

a second piezoelectric element sensitive to said acoustic vibration to produce an electrical output signal according to the acoustic pressure thereon from said vibration,

means for mounting said elements in close proximity to one another with said second element mounted in a fluid flow to be measured and movable away from said first element according to the intensity of said fluid flow,

said second element being arranged to produce said output signal with decreasing magnitude as the intensity of said fluid flow increases thereby increasing the spacing between said elements, and

means for detecting said output signal and providing an indication of the magnitude of said output signal.

4,351,193

SAMPLER FOR ANALYTICAL DETECTION SYSTEMS

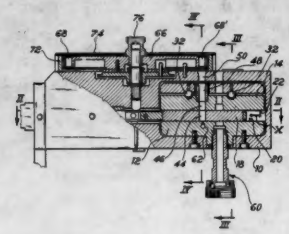
Bruno Colombo, Cologno Monzese, and Bruno Tosi, Carate Brianza, both of Italy, assignors to Carlo Erba Strumentazione S.p.A., Milan, Italy

Filed Jul. 28, 1980, Ser. No. 172,869

Claims priority, application Italy, Aug. 2, 1979, 24861 A/79

Int. Cl.³ G01N *1/28*

U.S. Cl. 73—864.82 **14 Claims**



1. A sampler for transferring samples to analytical detection systems, said sampler comprising a slidable support having a support sample receptacle for receiving a sample to be analyzed and seat means engaging said slidable support for preventing atmospheric contamination of said sample during transfer,

wherein said seat means has a first opening in contact with the atmosphere for passage of a sample into said support sample receptacle, said seat means has a second opening insulated from the atmosphere by said engagement for transfer of the sample from the support sample receptacle to the analytical system for analysis, and said seat means has at least one first inlet for introducing a protective gas,

wherein said slidable support is movable between a first position in which the support sample receptacle is aligned with said first opening and a second position in which the support sample receptacle is aligned with said second opening, and

wherein said slidable support and seat means define contact interfaces between the surfaces of said slidable support and said seat means having said openings and said support sample receptacle, and wherein said slidable support and seat means have at least one channel between each of said interfaces, said channels being in fluid communication with said first inlet, said channels being located so that they surround the support sample receptacle and said first and second openings when said slidable support is in both said first and second positions so as to provide means for the introduction of a fluid protective shield in the region between the engaging surfaces of said seat means and slidable support to avoid passage of air from the atmosphere between said engaging surfaces and thereby further prevent atmospheric contamination of said sample during transfer.

4,351,194

GYRO AUTOPHASE SYSTEM

Allen R. Taylor, Nutley, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed May 1, 1980, Ser. No. 145,517

Int. Cl.³ G01C *19/10*

U.S. Cl. 74—5.37 **2 Claims**

1. A system for reducing gyro phase ambiguity due to two proximately located gyros in interferring vibrational communication with one another by positioning a reference point on the rotor of a gyro in a preselected fixed phase relation with the excitatio field of a gyro driving motor, the system comprising:

a gyro rotor;

pick-off means associated with the rotor for determining the phase of a reference point on the rotor;

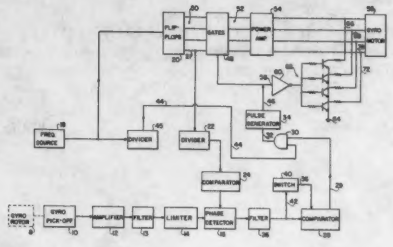
means for generating an excitation field for the motor;

detecting means connected in circuit, at its inputs, to the pick-off means and the generating means, for detecting the phase difference between the rotor reference point and the excitation field;

a window comparator connected at a first input thereof to the output of the detecting means;

switching means having an input thereof connected to the output of the detecting means;

a second input of the comparator connected to an output of the switching means for enabling the comparator when the output of the detecting means assumes a first polarity, the comparator being disabled by the switching means



when the output from the detecting means approaches a preselected phase range from an opposite polarity, thereby avoiding phase ambiguity between two proximately located gyros in interferring vibrational communication with one another; and

inhibit means connected between the output of the generating means and the gyro motor, the inhibit means having an input connected to the output of the comparator means for inhibiting power delivery from the excitation field generating means to the motor when the detected phase difference falls outside the preselected range, thereby causing the motor to slip until the detected phase difference falls within the preselected range.

4,351,195

PUSHBUTTON TUNER

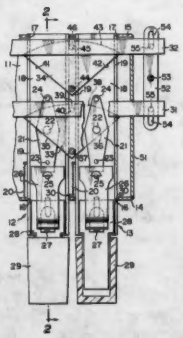
Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 140,445

Claims priority, application Japan, Apr. 18, 1979, 54-46602

Int. Cl.³ H03J *5/12*; G05G *1/02*

U.S. Cl. 74—10.33 **5 Claims**



1. A pushbutton tuner including a support, tuning means mounted on the support so as to be movable to positions corresponding to preset tuning frequencies, and a plurality of pushbutton actuators which may be selectively preset to bring the tuning means to positions corresponding to the tuning frequencies, each pushbutton actuator including a slide member having its opposite ends carried by the support so as to be movable between inoperative and operative positions relative to the support in a direction perpendicular to the direction of movement of the tuning means, a lockable control member pivotally mounted on the slide member for controlling the movement of the tuning means, the control member extending lengthwise of the slide member and fixedly carrying upright pins on its opposite ends, the tuning means including a pair of movable members, a link assembly having its each end pivotally connected with one of the movable members to cause a movement of one of the movable members whenever the other movable member is driven in the opposite direction, and means for transmitting the movement of the control member to at least one of the movable members to cause a movement of the latter movable member in one direction when the slide member is moved to its operative position, said one movable member ceasing to move in said one direction when a movement of the other movable member in the opposite direction which occurs in response to the movement of said one member is constrained by the control member, the transmitting means including a first and a second cam member each having its one end pivotally mounted on the support, the other end of the first and the second cam member being pivotally connected with one and the other of the movable members, respectively, each of the first and the second cam member having a cam edge, one of the cam edges being effective to cause an angular movement of one of the cam members in one direction in response to its engagement with one of the upright pins to thereby cause a movement of the other movable member in the opposite direction from the movement of said one movable member, the other cam edge being brought into engagement with the other upright pin to block the angular movement of the other cam member.

4,351,196

MULTISTAGE CHANGE-SPEED APPARATUS FOR A TRACTOR

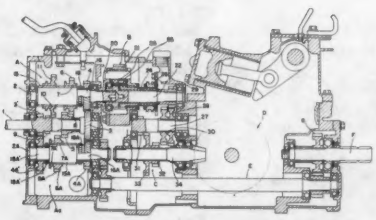
Jituo Yoshida, Izumi, and Kazuo Toyokuni, Sakai, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 16, 1979, Ser. No. 95,187

Claims priority, application Japan, Dec. 28, 1978, 53-179382[U]

Int. Cl.³ F16H *37/00, 37/06*

U.S. Cl. 74—15.4 **3 Claims**



1. A multi-stage change-speed apparatus for a tractor, comprising:

a main running-travel-system change-speed gearing apparatus (A) including an input shaft (1) and a first output shaft (2) disposed above said input shaft (1),

an intermediary transmission shaft (22) in axial alignment with said first output shaft (2),

a planetary gearing reduction apparatus (B) disposed between said first output shaft (2) and said intermediary transmission shaft (22) shiftable between super-reduction of speed from said first output shaft to said intermediary transmission shaft and for transmission without such reduction of speed,

a bevel pinion shaft (34) disposed below said intermediary transmission shaft (22),

a differential (D) operatively connected to said bevel pinion shaft (34), and

a power takeoff line change-speed gearing apparatus (Aa) including said input shaft (1) and a second output shaft (2A) disposed below said input shaft (1) in axial alignment with said bevel pinion shaft (34),

characterized in that

said main running-travel-system change-speed gearing apparatus (A) includes a helical gear (3) for high speed transmission and a spur gear (5) both securely fixed to said input shaft (1), a second helical gear (4) loosely fitted on said first output shaft (2), in constant engagement with said helical gear (3) and a first speed shifter (8) including a spur gear (6) engageable with said spur gear (5) and an engagement lug (7) fitted on a spline shaft portion (15) of said first output shaft (2), said first speed shifter (8) being slidable to cause the engagement lug (7) to fit on a spline portion (18) of said second helical gear (4),

said spline portion (18) of said second helical gear (4) has an identical shape with said spline shaft portion (15) of said first output shaft (2),

said power takeoff line change-speed gearing apparatus (Aa) including said helical gear (3) for high speed transmission, said spur gear (5), a third helical gear (4A) loosely fitted on said second output shaft (2A), in constant engagement with said helical gear (3) and a third speed shifter (8A) including a spur gear (6A) engageable with said spur gear (5) and an engagement lug (7A) fitted on a spline shaft portion (15A) of said second output shaft (2A), said thid shifter (8A) being slidable to cause the engagement lug (7A) of said third shifter (8A) to fit also on a spline portion (18A) of said third helical gear (4A),

said spline portion (18A) of said third helical gear (4A) has an identical shape with spline shaft portion (15A) of second output shaft (2A),

a speed-reduction shaft (27) disposed below said intermediary transmission shaft (22) and above said bevel pinion shaft (34), said speed-reduction shaft (27) carrying a large gear (28) in engagement with a small gear (29) mounted on said intermediary transmission shaft (22), an auxiliary change-speed gearing apparatus (C) being disposed between said speed-reduction shaft (27) and said bevel pinion shaft (34), and

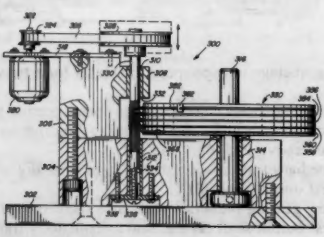
a transmission shaft (E) operatively connected to said second output shaft (2A) is disposed below bevel pinion shaft (34), and is also operatively connected to a power takeoff shaft F via a reduction gearing mechanism G.

4,351,197

PRECISION POSITIONING APPARATUS HAVING A ROTATING DRIVING ELEMENT AND A ROTATING DRIVEN ELEMENT

Donald G. Carson, 12108 Towner Ave., NE., Albuquerque, N. Mex. 87112

Filed Aug. 19, 1981, Ser. No. 294,225
Int. Cl.³ F16H *27/02, 29/02*
U.S. Cl. 74—89.22 **15 Claims**



1. Positioning apparatus, comprising, in combination:

driven means to be positioned, including a drum journaled for rotation and having a plurality of grooves extending circumferentially about the drum;

drive means for moving the driven means, including

a screw,

a plurality of helical threads on the screw, the pitch of which is directly related to the spacing of the grooves on the drum, and

means for rotating the screw to position the drum; and

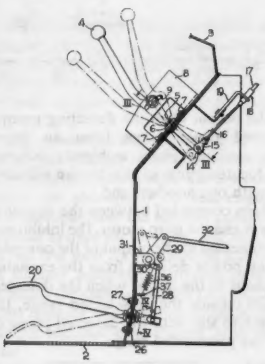
means for coupling the screw to the drum, including a cable having two ends secured to the drum and extending in the grooves of the drum and in the threads of the screw for rotating the drum in response to rotation of the screw.

4,351,198

HAND AND FOOT CONTROLLED THROTTLE

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 12, 1980, Ser. No. 186,573
Int. Cl.³ G05G *11/00, 5/16;* F16C *11/06*
U.S. Cl. 74—482 **20 Claims**



1. A motion transmitting mechanism comprising, a wall, a throttle lever including a manually controlled arm, an actuator arm, a journaled portion intermediate said arms extending through said wall, a bearing mounted on said wall supporting said journaled portion of said lever providing a sealed bearing assembly, a pedal having a journaled portion mounted for extending through said wall, a link means connected to said lever for operating a throttle, a linkage in conjunction with said link means and connected to said pedal for operating said throttle.

4,351,199

COVER PLATE ARRANGEMENT

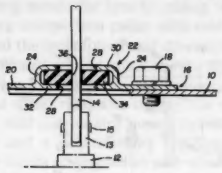
Robert E. Mozingo, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 14, 1980, Ser. No. 167,903
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—566 **1 Claim**

1. In a hydraulic control panel that houses a series of manually operable valves which control a plurality of hydraulic cylinders associated with an implement, the improvement comprising:

a one-piece plastic cover plate assembly mounted to said control panel and including a horizontal base with a plurality of upstanding, spaced-apart integral formations along the longitudinal extent of the base through which a plurality of control handles are inserted for attachment to said valves, each cover plate formation being generally box-shaped including upper and lower horizontal walls, opposed ends which are integrally formed with said base and with said upper and lower walls, and other ends

which are open, the lower horizontal walls of the formations lying generally in the same plane as the base, the individual formations further including aligned openings in the upper and lower walls to permit the insertion of the control handles through the cover plate, a closed-cell, rectangular rubber block insert sandwiched within each



cover plate formation with an opening therethrough which is aligned with the upper and lower openings in an individual formation, said cover plate block inserts permitting movement of said control handles while maintaining a seal to prevent contaminants from entering the control panel and said inserts biasing said control handles towards a vertical neutral position.

4,351,200

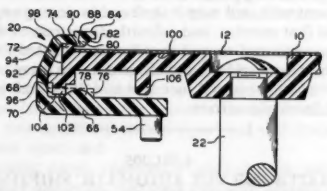
REMOVABLE SNAP-ON ACTUATORS FOR PROGRAM TIMER DIAL

Jerry W. McElroy, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 34,449, Apr. 30, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 176,862

Int. Cl.³ F16H *53/00;* H01H *43/10*

U.S. Cl. 74—568 T **1 Claim**



1. In a program timer,

a circular dial;

said dial having a top portion including a circular rib therein and a bottom portion including saw-tooth projections therein;

a plurality of actuators removably secured to said dial for operating a scheduled program;

each of said actuators having an upper portion secured to said top portion of said dial and a lower portion secured to said bottom portion of said dial;

means on said upper portion and lower portion of said each of said actuators for providing a snap-on securement thereof to said dial;

said upper portion of said each of said actuators including an arcuate projection which snaps over and bears against said circular rib in said top portion of said dial, and said lower portion of said each of said actuators including a triangular projection which enters one of said saw-tooth projections in said bottom portion of said dial and a spherical projection which snaps over and bears against said saw-tooth projections.

4,351,201

CRANKSHAFT ASSEMBLY

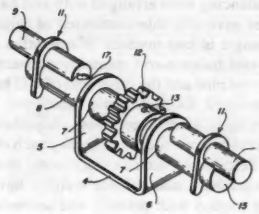
Manfred Link, Nuremberg, Fed. Rep. of Germany, assignor to Triumph-Adler A.G., Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,044

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023473

Int. Cl.³ F16C *3/10*

U.S. Cl. 74—598 **3 Claims**



1. A crankshaft assembly comprising a bearing having spaced arms,

a shaft supported for rotation between said arms with its ends extending outwardly from said arms,

at least one of said shaft ends having a recess on its periphery axially extending back toward one of said arms and an annular groove intersecting said recess,

a crankpin mounted in said recess with its axis parallel to said shaft axis,

said crankpin having an annular groove in alignment with said annular groove in said shaft, and

clamp means mounted in said aligned grooves resiliently embracing said shaft and urging said crankpin against said recess.

4,351,202

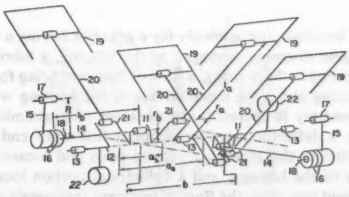
ENGINE

Robert F. Summers, 7945 Wellington St., Elmwood Park, Ill. 60635

Continuation of Ser. No. 879,439, Nov. 24, 1969, abandoned, Ser. No. 755,761, Aug. 8, 1968, abandoned, Ser. No. 694,024, Dec. 29, 1967, abandoned, Ser. No. 351,280, Mar. 9, 1964, abandoned, and Ser. No. 66,181, Oct. 31, 1960, abandoned, said Ser. No. 879,439, is a continuation-in-part of Ser. No. 755,761, , which is a continuation of Ser. No. 694,024, , which is a continuation-in-part of Ser. No. 351,280, , which is a continuation-in-part of Ser. No. 66,181,. This application Jun. 7, 1976, Ser. No. 694,049

Int. Cl.³ F16H *57/02;* F16C *3/04;* F02B *75/06*

U.S. Cl. 74—604 **18 Claims**



1. A balanced, V-type, four-cylinder, four-cycle internal-combustion engine comprising: two angularly separated banks of two cylinders each; a reciprocating element in each said cylinder for transmitting power; a crankshaft having four power crankpins for receiving power from said cylinders, two of said power crankpins angularly indexed with respect to the axis of said crankshaft to reach top center positions and said other two power crankpins angularly indexed to reach bottom

center positions simultaneously in reference to the respective cylinders, and two balance crankpins, the aforementioned engine elements developing primary and secondary inertia shaking forces and couples; a pair of balancing units each comprising a balance rod, a balance weight, and a balance rocker and a surrounding, static structure, said balancing units being driven by said balance crankpins, said two balance crankpins disposed toward opposite ends of said crankshaft and angularly indexed to approximately opposed positions, each of said balancing units arranged with said balance rod and balance rocker pivotally interconnected at adjacent ends to form a right angle in one instance of operation and with the other end of said balance rod rotatably connected to one of said balance crankpins and the other end of said balance rocker pivotally connected to said static structure, said balance weight consisting of an enlarged mass supported by said balance rod and said balance rocker, whereby each of said balance weights may describe an arcuate, oscillating motion on rotation of said crankshaft, said balance weights having a weight and oscillating motion with primary and secondary harmonic components in two directions of such amplitudes as to produce primary and secondary forces and couples which balance said inertia shaking forces and couples produced by said engine elements.

4,351,203

GEAR BOX BREATHER PLUG ASSEMBLY

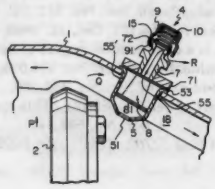
Koichi Fukunaga, Toyota, Japan, assignor to Toyota Jodosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 22, 1980, Ser. No. 180,418

Claims priority, application Japan, Aug. 30, 1979, 54-118450[U]

Int. Cl.³ F16H *57/02*; F16K *15/00*

U.S. Cl. 74—606 R **4 Claims**



1. A breather plug assembly for a gear box having a housing and a gear assembly, arranged in the housing, a lubricant oil being stored in the housing, a flow of lubricant being formed in the housing along the inner surface of the housing when the gear assembly is operated, said breather plug assembly comprising: a deflector member having a first open end fixedly connected to the housing a second open end located in the interior of the housing; and a cylindrical portion located between said two ends, the flow of lubricant transversly contacting with the cylindrical surface of said cylindrical portion; and valve means connected to said first end of said deflector member for providing, in response to the pressure in said housing, a fluid connection between the interior of said housing and the atmosphere, said deflector member being, at the cylindrical surface, provided with at least one hole which is located downstream of the flow of the lubricant along the inner surface of the housing.

4,351,204

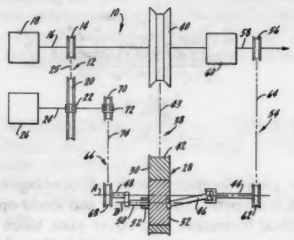
ACCESSORY DRIVE ASSEMBLY WITH COMPACT GEAR DIFFERENTIAL

Louis Ross, Addison, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 9, 1979, Ser. No. 92,885

Int. Cl.³ F16H *1/28, 37/08*

U.S. Cl. 74—804 **3 Claims**



1. In a vehicle having an engine with a crankshaft, a transmission with an output shaft, and associated accessories with a drive shaft, an accessory drive assembly comprising a first speed-reducing drive train adapted for driven engagement with said crankshaft and driving engagement with said drive shaft, said first drive train being constructed and arranged such that said drive shaft may overrun said first drive train, a differential including an outer ring gear rotatable on a first axis, an inner star gear orbital about said first axis and rotatable on a second axis, first and second members rotatable on said first axis, means connecting said star gear with said first member for transmitting rotational movement therebetween, and means connecting said star gear with said second member for translating orbital movement of said star gear into rotational movement of said second member, a second drive train adapted for driven engagement with said crankshaft and in driving engagement with said ring gear, a third drive train adapted for driven engagement with said output shaft and in driving engagement with said first member, and a fourth drive train in driven engagement with said second member and adapted for driving engagement with said drive shaft, said fourth drive train being constructed and arranged such that said drive shaft may overrun said fourth drive train.

4,351,205

APPARATUS FOR THE AUTOMATIC SHIFTING OF A STEPPED SPEED-CHANGE TRANSMISSION, ESPECIALLY FOR AUTOMOTIVE VEHICLES

Günter Fischer, Markdorf, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,475

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812742

Int. Cl.³ B60K *41/06, 41/28*

U.S. Cl. 74—866 **15 Claims**

1. In an automotive vehicle having a gear-type transmission for transferring rotary power from an engine to an output shaft, said transmission having a multiplicity of gears, an electronic device for automatically shifting said transmission, comprising:

first memory means for storing in coded form speed ranges for said gears under different loading conditions;

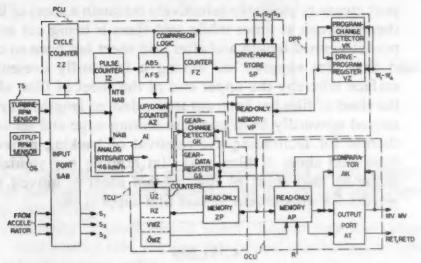
addressing means operatively linked to said memory means for feeding thereto address signals in accordance with engine load and engaged gear;

window-generating means responsive to signals from said memory means for emitting upshifting comparison pulses and downshifting comparison pulses with durations varying as functions of engine load and engaged gear;

sensor means juxtaposed to said output shaft for emitting a signal coding the instantaneous rotation rate thereof;

timing means responsive to the signal from said sensor means for generating during each operating cycle a first rotation-rate signal and a second rotation-rate signal each having a duration proportional to said instantaneous rotation rate, said timing means being operatively linked to said window-generating means for synchronizing the emission of said upshifting comparison pulse with said first rotation-rate signal and the emission of said downshifting comparison pulse with said second rotation-rate signal;

comparator means for comparing said instantaneous rotation rate with said speed ranges to control the shifting of said transmission, said comparator means including an upshifting flip-flop and a downshifting flip-flop, both of the D-type, with inputs connected to said window-generating means for receiving therefrom said upshifting comparison



pulses and said downshifting comparison pulses, respectively, and to said timing means for receiving therefrom said first rotation-rate signal and said second rotation-rate signal, respectively, said upshifting flip-flop generating an upshifting control signal upon an exceeding of an upper speed limit by said instantaneous rotation rate and said downshifting flip-flop generating a downshifting control signal upon an exceeding of said instantaneous rotation rate by a lower speed limit;

second memory means for storing in coded form the engaged gear of said transmission, said comparator means being operatively connected to said second memory means for updating the contents thereof in accordance with said upshifting control signal and said downshifting control signal; and

energization means operatively controlled by said second memory means for operating gear-shift actuators in said transmission.

4,351,206

ELECTRONIC AND HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC GEAR CHANGE TRANSMISSION

George E. Lemieux, and Tom T. Tibbles, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1980, Ser. No. 143,997
Int. Cl.³ F16H *3/74;* B60K *41/04*
U.S. Cl. 74—866 **11 Claims**

1. In a control system for an automatic gear change transmission adapted to deliver torque from a driving member to a driven member, having gear elements forming plural torque delivery paths between the driving and driven members and a plurality of clutch and brake means for controlling the relative motion of the gear elements to provide a plurality of forward and reverse speed ratios comprising:

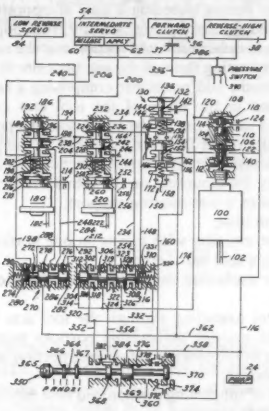
a fluid pump;

a manual selector valve moveable among a plurality of positions corresponding to the forward and reverse drive ranges and communicating with the discharge side of said pump;

first and second ON/OFF valves operating in response to the position of said manual valve for selectively pressurizing outlet chambers formed therein;

an electronic control adapted to provide electrical output signals to produce the selected speed ratio of operation;

first and second solenoid valves communciating with the outlet chambers of said first and second ON/OFF valves, adapted to produce automatic shifting among the forward drive ratios of the transmission by selectively pressurizing



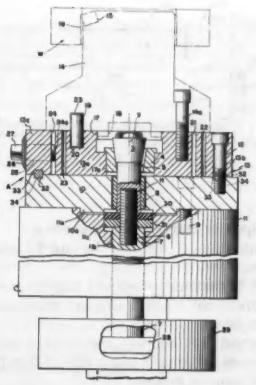
the clutch and brake means according to the electrical output signals received by said solenoid valves from said electronic control and the effect of pressure received from the outlet chambers of said first and second ON/OFF valves, whereby shifting among any of the drive ratios can occur if said electronic control produces no output signal by manually moving said manual valve to the desired drive range position.

4,351,207

MICROMETRICALLY ADJUSTED TOOL ARM ASSEMBLY

Carl H. Werth, Jr., Bridgeport, Mich., assignor to Werth Engineering, Inc., Bridgeport, Mich.

Filed Oct. 3, 1980, Ser. No. 193,431
Int. Cl.³ B23B *29/034, 29/18*
U.S. Cl. 82—36 R **12 Claims**



1. In a micrometrically adjusted tool arm assembly for mounting on a spindle or a non-rotating support, having a

resilient tool arm with axially extending means thereon for generally centrally supporting an axially extending tool bar, and having its end sections only secured to a base support; deformable slot means extending axially through the tool arm to condition the central section for planar radial movement relative to the ends of the arm perpendicular to said axially extending tool bar supporting means; a micrometrically adjustable positioner engaging said central section in a position relative to said slot means to provide a rigid backup for said tool bar; said slot means including a pair of oppositely disposed, closely spaced slots extending laterally from opposite sides of the tool arm between each end section and the central section, each slot terminating short of the side opposite to the side from which it extends, said positioner comprising a radially adjustable abutment in the plane of the tool arm contacting the radially inner face of one of the outer slots at a position at least partly laterally offset from the inner slot of the pair.

9. In a micrometrically adjustable remotely controlled tool arm assembly for mounting on the tubular rotary spindle of a machine tool or a non-rotating support;

(a) a tool arm base;

(b) a resilient tool arm with means on one portion thereof for supporting a tool bar thereon;

(c) means for anchoring another portion of the tool arm to the base;

(d) slot means extending through the tool arm between said portions to provide deformable portions permitting radial movement of the tool bar supporting portion relative to said another portion;

(e) the tool bar supporting portion and base having axial openings provided therein;

(f) an actuator extending axially through the base and tool bar supporting portion;

(g) means for moving the actuator; and

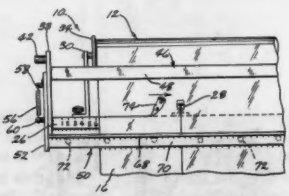
(h) means cooperating between said actuator and tool bar supporting portion for drawing the tool bar supporting portion axially down to lock it to the base when the actuator is moved and simultaneously moving the tool bar supporting portion radially.

4,351,208

FILM DISPENSER AND SLITTER

Wendall C. Cobleigh, and Donald L. Barmore, both of Lincoln, Nebr., assignors to Professional Marketing Associates, Lincoln, Nebr.

Filed Sep. 18, 1980, Ser. No. 188,531
Int. Cl.³ B26D 7/00
U.S. Cl. 83—167 **5 Claims**



1. A film dispenser and slitter, comprising,

an upstanding support member having forward and rearward ends,

an elongated horizontally disposed support means mounted on the upper end of said support member and having opposite ends,

first and second roll support members mounted on said support means for supporting a roll of film therebetween above said support means,

at least one of said roll support members being selectively slidably mounted on said support means to permit rolls of various lengths to be supported therebetween,

first and second bracket members at the opposite ends of said support means and extending upwardly therefrom,

a first film support bar secured to said first and second bracket members and extending therebetween above said support means,

at least one film slitter selectively movably mounted on said support means for slitting film as a sheet of film is pulled downwardly from the roll of film positioned thereabove,

said support means having a horizontally dipsosed film cutting edge provided thereon below said film slitter for facilitating the cutting of the sheet of film to a predetermined length after it has been slit,

a film holding bar assembly operatively pivotally mounted on said first and second bracket members and including a film holding bar which is pivotally movable from an inoperative position generally above said first film support bar to an operative position wherein said film holding bar is closely positioned adjacent the forward end of said support means to yieldably selectively maintain a sheet of film therebetween at times while said sheet is being cut to its predetermined length and after said sheet has been so cut,

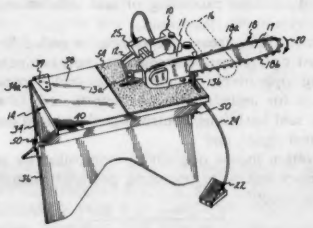
said first film support bar having a forwardly presented surface whereby the upper end of the sheet of film, after the sheet of film has been cut to the desired length, may be moved upwardly from said film cutting edge and secured thereto for facilitating the removal of backing material from said sheet of film, said film holding bar yieldably engaging said sheet of film as said sheet is moved upwardly for attachment to said film support bar.

4,351,209

REMOTE CONTROL BENCH MOUNTED CHAIN SAW APPARATUS

Steven D. Alford, 426 Birch Rd., Coon Lake Blvd., Wyoming, Minn. 55092

Filed Jun. 17, 1980, Ser. No. 160,146
Int. Cl.³ B27B 17/02; B25H 1/04
U.S. Cl. 83—788 **18 Claims**



1. Apparatus for cutting firewood in cooperation with a chain saw having a handle, trigger, body and bar and chain, the apparatus comprising:

a bench including:

a first support panel member having an interdigital slot;

a second support panel member having a cooperating interdigital slot for mating with said first support panel member to form a cross; and

a top member for supporting the chain saw in a position which permits cutting access to a top of the bar and chain, the top member being hingedly mounted on the first support panel member proximate an upper edge parallel to its slot in the first support panel member, the top member being provided with means to detachably engage the second support panel member proximate an upper edge parallel to its slot when the cross is formed to position the top member in a horizontal position;

means for holding the chain saw on the top members; and

remote control means operably connected to the chain saw and having an activator positioned remote from the chain

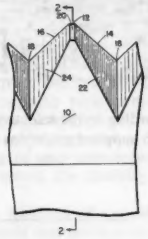
saw and the top member for control of the operation of the chain saw.

4,351,210

SHEAR CUT TOOTH

Thomas W. McKindary, Totowa, N.J., assignor to Zimmer Manufacturing Corp., Hawthorne, N.J.

Continuation-in-part of Ser. No. 962,421, Nov. 20, 1978, abandoned. This application Aug. 11, 1980, Ser. No. 176,809
Int. Cl.³ B62D 7/00
U.S. Cl. 83—835 **6 Claims**



1. A cutting rule of a general type having an elongated flat body portion with teeth formed along at least one edge thereof and comprising:

a plurality of teeth spaced apart along at least one edge of said cutting rule, the rear side of said rule having a slightly beveled first surface;

each tooth having a tip with a straight edge for piercing stock material, said straight edge being about one-twelfth the space between adjacent tooth tips;

each tooth having first and second tooth edges diverging from one another and extending angularly from each side of said tip toward the body portion of said rule, said edges terminating at notches formed by the points of intersection with side edges of adjacent teeth;

said first and second edges of adjacent teeth intersecting a datum line at the same angle such that each tooth is symmetrical in shape, said notches being distant from an imaginary line along the longitudinal tip edge of said rule about one-half the distance between adjacent teeth;

said tooth tips having a second beveled surface, said second surface being beveled angularly from the front of said rule toward the rear of said rule such that said tips have a chisel-like structure; said rear side of each of said tooth tips each having a slightly beveled third surface, said third surface being beveled angularly from said tip straight edge downward towards the rear side of said rule.

4,351,211

METHOD AND APPARATUS FOR CUTTING BLANKS FROM FOAM MATERIAL

Georges P. Azzolini, Juziers, France, assignor to Sovra S.A., Juziers, France

Filed Oct. 14, 1980, Ser. No. 196,522
Claims priority, application France, Mar. 25, 1980, 80 06914
Int. Cl.³ B26D 7/08
U.S. Cl. 83—861 **12 Claims**

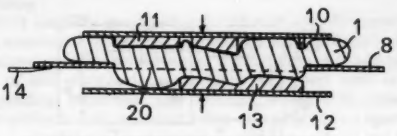
1. A method for cutting out pieces of plastic foam material into desired shapes, the pieces having a cavity with a bottom wall at different levels, said method comprising the steps of:

compressing a block of foam material between a first plate and a die having an aperture of suitable contour;

interposing between the first plate and the die a relief form member generally corresponding in shape to the cavity to be formed in resultant piece of foam material;

applying a back relief form member against part of the block of foam material caused to protrude through the (aperture in) die, the back relief form member having different levels corresponding to the different levels of the bottom wall of the cavity;

displacing a cutting blade relative to the die between the die and the back form member through the protruding part of the compressed block; and



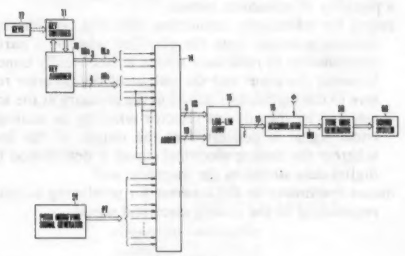
relieving the pressure applied to the block of foam material to separate and remove the pieces of the block of foam material thus cut.

4,351,212

ELECTRONIC MUSICAL INSTRUMENT WITH EQUALLY SPACED BINARY NOTE CODES

Shimaji Okamoto, and Yohei Nagai, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Apr. 21, 1980, Ser. No. 141,826
Claims priority, application Japan, Apr. 23, 1979, 54-50012
Int. Cl.³ G10H 1/00
U.S. Cl. 84—1.01 **10 Claims**



1. An electronic musical instrument comprising:

means for producing note codes respectively having n bits (n is a positive integer) representing juxtaposed notes aligned by a semitone interval step in a musical scale, said note codes producing means including a binary code table consisting of successively aligned binary values corresponding to an order of alignment of the notes in a musical scale, said binary code table omitting those binary values corresponding to either one of the largest and smallest values normally represented in a binary series by the lowest m bits of said n bits (where m is a positive integer smaller than n);

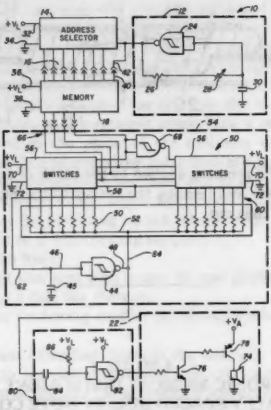
means coupled to said producing means for generating modified note codes from said note codes, said generating means including means for repetitively adding the lowest m bits of each of said note codes to further lower order bit positions within said means for adding, below the least significant bit of said each note code; and

means coupled to said generating means for producing musical tones having frequencies corresponding to said modified note codes.

4,351,213
PLAYER FOR DIGITALLY RECORDED MUSIC

Paul C. Brown, Arlington, Tex., assignor to Convey, Inc., Irving, Tex.

Filed Aug. 20, 1979, Ser. No. 67,783
Int. Cl.³ G10H *5/10*
U.S. Cl. 84—1.01 **9 Claims**



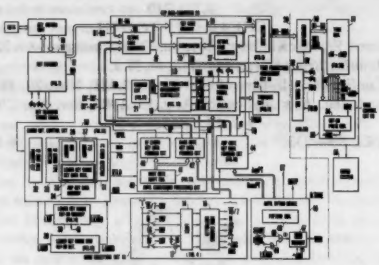
1. An apparatus for transforming digital data stored in an addressable memory into sounds, comprising in combination:
an oscillator;
an address selector driven by the oscillator for selecting an address in the memory;
an inverter having an input and an output;
a plurality of resistance means;
means for selectively connecting differing combinations of resistance means from the plurality wherein a particular combination of resistance means is electrically connected between the input and the output of the inverter responsive to the digital data stored in the memory at the address selected by the address selector whereby an analog electrical signal is generated at the output of the inverter wherein the analog electrical signal is determined by the digital data stored in the memory; and
means responsive to the inverter for producing sounds corresponding to the analog electrical signal.

4,351,214
ELECTRONIC MUSICAL INSTRUMENT WITH PERFORMANCE MODE SELECTION

Hideo Suzuki, Kamimura, and Makoto Kaneko, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 27, 1981, Ser. No. 228,782
Claims priority, application Japan, Jan. 28, 1980, 55-8607
Int. Cl.³ G10H *1/36, 5/00, 7/00*
U.S. Cl. 84—1.03 **23 Claims**

1. An electronic musical instrument comprises:
a plurality of keys;
means for forming time division multiplex first key data determined by the depressed status of all keys;
means for generating key codes corresponding to all keys synchronized with said key data;
key code memory means having a plurality of channels less than the total number of keys and receiving outputs of said key code generating means;
tone generating means having a plurality of musical tone production channels corresponding to individual channels of said key code memory means;
means for selecting one of plural performance modes;
assign channel setting means for storing said key codes from said key code generating means in selecting subsets of the channels of said key code memory means in different

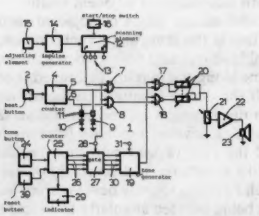


manners according to the selected performance mode and in response to supplied multiplex key data.

4,351,215
DEVICE FOR THE ACOUSTIC INDICATION OF THE BEATS OF A MUSICAL TIME

Hendrik D. van der Bruggen, Loggerstraat 34, 1503 KD Zaandam, Netherlands

Filed Jan. 7, 1981, Ser. No. 223,132
Claims priority, application Netherlands, Jan. 25, 1980, 8000494
Int. Cl.³ G09B *15/02;* G10H *1/40, 1/46*
U.S. Cl. 84—1.03 **11 Claims**

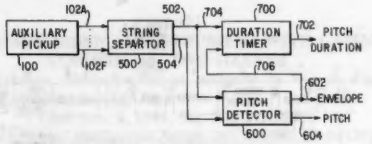


1. A device for the acoustic indication of a musical time, said musical time comprising a plurality of musical beats with musical properties comprising volume, pitch, tempo and reproduction period, said device comprising means for varying the musical properties of each beat separately, wherein said varying means comprises N switch elements each connected to an associated binary counter with two outputs, one output of which is connected to a first input of a first gate circuit and the other output of which is connected to a first input of a second gate circuit, a second input of each of the first and second gate circuits being connected to one of N outputs of a scanning element for the cyclic consecutive scanning of the N first and second gate circuits, wherein the N first gate circuits are connected by their outputs to a first input of a first switch circuit and the N second gate circuits are connected by their outputs to a first input of a second switch circuit, wherein a second input of the first and second switch circuits is connected to the output of a tone generator unit, the outputs of said first and second switch circuits being connected to a sound reproduction system.

4,351,216
ELECTRONIC PITCH DETECTION FOR MUSICAL INSTRUMENTS

Russell O. Hamm, 78 Horatio St., New York, N.Y. 10014

Filed Aug. 22, 1979, Ser. No. 68,689
Int. Cl.³ G10H *3/00*; G01R *23/02*
U.S. Cl. 84—1.15 **44 Claims**



1. An auxiliary pick-up for use in a stringed musical instrument having an electromagnetic pick-up mounted thereon in addition to said electromagnetic pick-up, which electromagnetic pick-up includes a pole piece and at least one winding dedicated to each string of said instrument and mounted in spaced relationship therefrom, the auxiliary pick-up comprising:

a substantially planar substrate of non-conductive material adapted to be mounted intermediate said strings and said electromagnetic pick-up in spaced relationship from said strings;

a plurality of conductive, electrically isolated coils on said substrate, each coil positioned to be in alignment with a different pole piece when said substrate is in its mounted position, said coils sensing vibrations of said strings independently of said windings when said substrate is in its mounted position.

15. A transition detector responsive to an input signal having a time-variable envelope representing a sound produced by a musical instrument for generating a binary signal in which each cycle has a period that is substantially equal to that of the corresponding cycle in said input signal, said transition detector comprising:

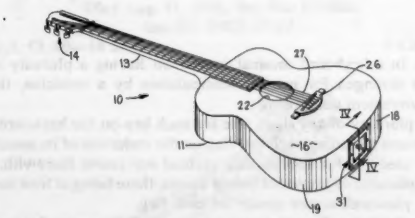
a source of an adaptive, time variable threshold voltage proportional to the envelope of said input signal and substantially lower in magnitude than the peak thereof; and

means for generating a binary signal having a triggering edge coincident with each crossing of said input signal through said threshold level in a predefined direction.

4,351,217
REMOVABLE TAILBLOCK

Abraham J. Wechter, 2131 Sheffield Dr., Kalamazoo, Mich. 49008

Filed Mar. 7, 1980, Ser. No. 128,004
Int. Cl.³ G10D *1/08, 3/00*; G10H *3/18*
U.S. Cl. 84—1.16 **10 Claims**



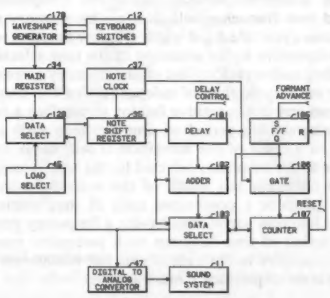
1. In a stringed instrument having a hollow main body forming a sound box, said hollow main body being defined by opposed top and bottom walls joined together by a side rim and having a head end and a tail end at opposed locations on said side rim, a long neck attached to said hollow main body adjacent said head end thereof and projecting outwardly therefrom in substantially parallel relationship with a longitudinal centerline which extends between said head end and said tail end of said hollow main body, a plurality of strings extending along said neck and having opposite ends thereof attached to said neck and said main body, and a tailblock fixed to said main body at said tail end thereof, said tailblock being substantially aligned with said longitudinal centerline, the improvement comprising:

a tailblock assembly associated with said main body for permitting convenient access into said hollow main body through an access opening formed in said rim and located at said tail end of said main body in substantial alignment with said longitudinal centerline, said tailblock assembly including said tailblock with the latter being of a ringlike configuration, said tailblock being fixed to said rim at said tail end of said main body in substantial alignment with said longitudinal centerline, said ringlike tailblock defining said access opening therethrough, said tailblock assembly also including an access plate removably positioned within said access opening for closing same, said ringlike tailblock and said access plate having means cooperating therebetween for fixedly stationarily positioning said access plate within said access opening, said latter means permitting said access plate to be selectively removed from said access opening.

4,351,218
RECURSIVE FORMANT GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Apr. 2, 1981, Ser. No. 250,474
Int. Cl.³ G10H *1/08, 7/00*
U.S. Cl. 84—1.19 **10 Claims**



1. In combination with a musical instrument having a waveshape memory storing a plurality of waveshape data points corresponding to the amplitudes of a corresponding number of evenly spaced points defining a period of a musical signal and in which said data points are sequentially and repetitively read out of the waveshape memory and transferred to a digital-to-analog converter at a rate corresponding to the pitch of the musical note being generated, apparatus for producing a sliding formant effect comprising;

a note clock for generating timing signals corresponding to the pitch of said generated musical note,

addressing means responsive to said timing signals whereby data is sequentially and repetitively read out of said waveshape memory,

a delay means for storing data read out of said waveshape memory,

an adder means whereby data read out of said waveshape memory is summed with data stored in said delay means to form a summed data set,

a formant signal advance generator means for generating a formant advance signal,

a first data select means whereby said summed data set is selected in response to said formant advance signal and whereby said data read out of said waveshape memory is selected if said formant advance signal is not generated,

a second data select means whereby data selected by said first data select means is stored in said waveshape memory, and

conversion means wherein data selected by said first data select means is converted to said musical signal thereby producing said sliding formant effect.

4,351,219

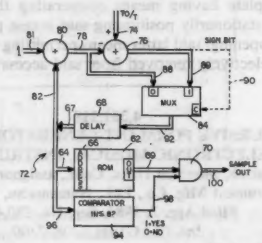
DIGITAL TONE GENERATION SYSTEM UTILIZING FIXED DURATION TIME FUNCTIONS

Steven C. Bass, Stockwell, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Sep. 25, 1980, Ser. No. 190,631

Int. Cl.³ G10H *1/12, 7/00*

U.S. Cl. 84—1.21 **22 Claims**



1. An electronic musical instrument comprising: player actuated tone frequency selection means, memory means for storing one cycle of a fixed width window function waveform, means responsive to the actuation of the tone selection means for reading said waveform out of said memory means at a fixed rate for each cycle thereof independent of the frequency selected and and in a repetitive fashion to produce a continuous signal wherein the period of time between each successive reading of a cycle of the waveform is selectively adjusted in response to the frequency selected by the tone selection means without changing the width of the read out waveform to thereby produce a continuous train of time sequential said window function waveforms having a frequency proportional to the period of time between each successive reading, and means responsive to the train of read out waveforms for filtering said train to produce a musical tone.

4,351,220

ELECTRONIC MUSICAL INSTRUMENT OF DIGITAL PROCESSING TYPE

Shigeru Yamada, Hamamatsu, and Kiyoshi Ichikawa, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

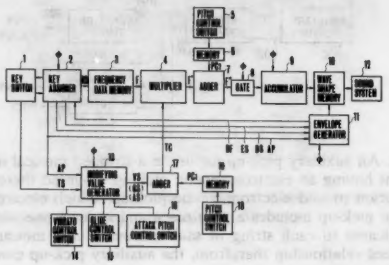
Continuation of Ser. No. 880,094, Feb. 22, 1978, abandoned. This application May 9, 1980, Ser. No. 148,504

Claims priority, application Japan, Feb. 26, 1977, 52-20444

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **1 Claim**

1. An electronic musical instrument comprising a plurality of keys, a first circuit for producing a numerical value corresponding to a frequency related to an operated key, a second circuit responsive to a modifying signal for modifying said numerical value to generate a modified signal, a third circuit for producing a musical tone having a frequency corresponding to said modified signal, a fourth circuit selectively operable for applying to said second circuit said modifying signal whose value increases gradually from a first value to a second value and thereafter maintained at said second value, said second circuit including a multiplier circuit for multiplying the signal value from said fourth circuit with said numerical value, and a control device containing an operating switch which operates and controls said fourth circuit in response to a key operation, said operating switch when closed maintaining the output of said fourth circuit at said first value whereas when open gradually varying the output of said fourth circuit toward said second value, said first value being assumed at an instant when a



key is operated; and further comprising a circuit for generating a first constant value which is selectable but does not vary with time and a first adder for adding said first constant value and the value from said fourth circuit to send its output to said multiplier circuit; and a circuit for generating a second constant value which is selectable but does not vary with time; and a second adder arranged between said second and third circuits so that said second constant value is added to said first adder.

4,351,221

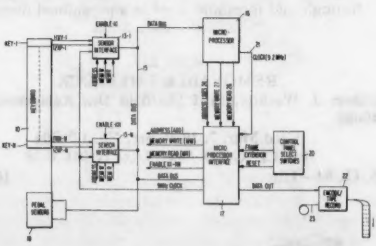
PLAYER PIANO RECORDING SYSTEM

Roger L. Starnes; Ernest D. Henson; Thomas J. Wilkes, all of Lewisburg, and James M. Sharp, Cornersville, all of Tenn., assignors to Teledyne Industries, Incorporated, Los Angeles, Calif.

Filed Jun. 15, 1979, Ser. No. 48,938

Int. Cl.³ G10H *3/03, 1/02;* G10G *3/04;* G10F *1/02*

U.S. Cl. 84—1.28 **15 Claims**



1. In a keyboard musical instrument having a plurality of keys arranged for manual manipulation by a musician, the improvement comprising

a plurality of key flags, one for each key on the keyboard,

means mounting each key flag on the underside of its associated key for substantially vertical movement therewith,

a plurality of photocell sensor means, there being at least one photocell sensor means for each flag,

each photocell sensor means having a light source for projecting light across a path and means on the opposite side of said flag from said light source for detecting flag movements in said path,

each flag having an opaque portion and a transparent portion, there being at least one straight line of demarcation between said opaque and non-opaque portions, said

straight line of demarcation being at an angle other than horizontal or vertical, and

means for supporting each said photocell for independent horizontal adjustment relative to the path of movement of said at least one straight line of demarcation on its corresponding flag to cause in effect a vertical adjustment of each key by a horizontal movement of its related sensor.

4,351,222

KEYBOARD MUSICAL INSTRUMENT WITH CASING COMPRISING TWO HALVES

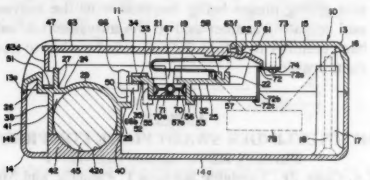
Shinji Kumano, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jun. 9, 1981, Ser. No. 272,029

Claims priority, application Japan, Jul. 4, 1980, 55-94135[U]; Jul. 4, 1980, 55-94136[U]; Jul. 4, 1980, 55-94137[U]; Jul. 4, 1980, 55-94138[U]; Jul. 4, 1980, 55-94139[U]

Int. Cl.³ G10C *3/12, 3/04*

U.S. Cl. 84—423 R **12 Claims**



1. A keyboard musical instrument which comprises:

(a) a casing comprising molded upper and lower shells coupled together to form the casing;

(b) a plurality of keys mounted on said upper shell in juxtaposed relation; and

(c) means mounted on said upper shell for normally urging said keys into raised positions;

(d) said upper shell including fulcrum means formed integrally therewith which supports each key for pivotal movement thereabout between its raised and depressed positions, integral stop means for limiting the downward and upward movements of said keys, integral guide means for guiding the downward and upward movements of each key to prevent the lateral movement thereof, and integral mounting means for supporting a key switch structure, all of said stop means, said guide means and said mounting means being disposed in underlying relation to said juxtaposed keys.

4,351,223

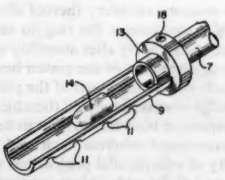
BURST FIRE COMPENSATOR

Edward M. Schmidt, Harford City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 11, 1980, Ser. No. 177,031

Int. Cl.³ F41F *17/12*

U.S. Cl. 89—14 R **5 Claims**



1. A burst fire compensator adapted to be rotatably attached to the barrel of a gun, comprising; a tubular collar adapted to fit over said barrel of said gun near the muzzle thereof, an asymmetric channel integrally attached to said collar, said asymmetric channel comprising an approximately half cylindrical projection forming an extension of approximately one half of said barrel, a plurality of lateral holes in said asymmetric channel running from the interior thereof to the outside thereof, said lateral holes being offset from alignment with the radial generators of said half cylindrical projection, means to adapt said compensator for rotation around said barrel after each round is fired, said means comprising said lateral holes and a spring-loaded ball mounted in a radial hole in said tubular collar, said ball engaging an annular groove in the perphery of said barrel, and detent means comprising one or more detent holes disposed along said groove adapted to be engaged by said spring-loaded ball.

4,351,224

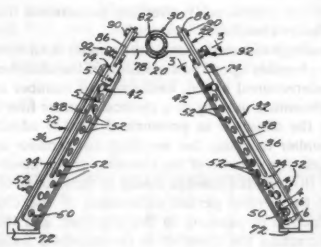
BIPOD MECHANISM FOR SMALL ARMS

George F. Curtis, Sanford, Me., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Apr. 7, 1980, Ser. No. 137,780

Int. Cl.³ F41C *29/00*

U.S. Cl. 89—37 BA **11 Claims**



1. A bipod mechanism for a small arms weapon comprising a pair of individually telescopically adjustable leg assemblies and means connectable in supporting relation with the weapon mounting said pair of leg assemblies in a weapon supporting and firing position wherein said leg assemblies extend downwardly in outwardly converging relation with respect to the longitudinal extent of said weapon, the improvement which comprises:

each of said leg assemblies including an inner leg member of generally L-shaped cross-sectional configuration and an outer leg member of generally L-shaped cross-sectional configuration mounted in generally nested relation with said inner leg member;

pin and slot means between said inner and outer leg members mounting the same for relative longitudinally sliding movement with respect to one another while in said nested relation, said pin and slot means including a longitudinally extending slot in each of said leg members and a headed pin extending through the slot in each leg member and secured to the other leg member; and

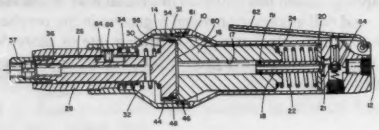
means for releasably securing said leg members in a plurality of different positions of relative longitudinal movement with respect to one another including a retracted position wherein said leg members are generally longitudinally coextensive.

4,351,225

VIBRATION ATTENUATION CONSTRUCTION FOR AN IMPACT AIR TOOL

Karl A. Brandenberg, Chehalis, Wash., and Wilbert G. Kautz, Bryan, Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed Jan. 17, 1980, Ser. No. 112,864
Int. Cl.³ F01L *21/02*; F01B *15/02*
U.S. Cl. 91—50 **9 Claims**



1. A vibration and noise attenuation construction in a fluid driven tool comprising, in combination:

a housing;

a working member and a balancing member mounted in opposed relation, both members being mounted for reciprocal movement in the housing toward and away from each other;

means for continuously imparting a force on both the working member and the balancing member to drive the members toward one another;

one of said working member and said balancing member defining a piston and the other of said working member and said balancing member defining a cylinder having a cylinder wall for slidable receipt of the piston, said piston being mounted for reciprocal movement in the cylinder, said piston and cylinder defining a closed cylinder chamber;

means for continuously directing pressurized fluid into the cylinder chamber;

and passage means through the cylinder wall for exhausting the chamber upon the expansion of the chamber beyond a predetermined extent, said working member and balancing member moving in a cyclical manner first by expanding the chamber as pressurized fluid is admitted to the chamber to cause the members to translate apart to increase the volume of the chamber and connect the chamber through the passage means to the outside of the chamber to thereby permit exhaustion of the chamber and reduction of pressure in the chamber, and thereafter by contracting the chamber as the members translate in the reverse direction toward one another due to the reduced pressure in the chamber, said reverse direction movement closing the passage means and permitting the fluid in the chamber to define a means for damping the movement of the piston and cylinder toward each other.

4,351,226

FLUID CONTROL SYSTEM

Luc P. Cyrot, Mission Viejo, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 27, 1980, Ser. No. 153,363
Int. Cl.³ F15B *13/16*
U.S. Cl. 91—387 **9 Claims**

1. A fluid control system that includes, a fluid motor, a control valve, and a control valve actuator, said control valve actuator comprising:

an actuator member;

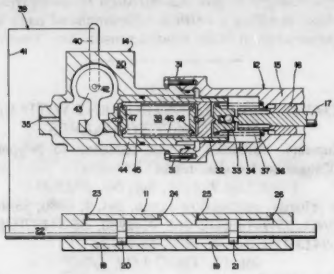
means on said actuator member responsive to a command signal for moving said actuator member with respect to an equilibrium position;

means for mechanically connecting said actuator member to said control valve;

a feedback member that slidably supports and carries said actuating member;

means for mechanically connecting said feedback member to said fluid motor; and

spring means acting between said actuator member and said feedback member and exerting a force on said actuator member whose magnitude varies with the distance between said actuator member and said feedback member,



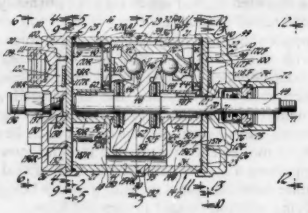
said spring means being responsive to the movement of said actuator member and to the movement of said feedback member to return the actuator member to its equilibrium position.

4,351,227

MULTICYLINDER SWASH PLATE COMPRESSOR PISTON RING ARRARNGEMENT

Carl A. Copp, Jr., Vandalia; Richard T. Pandzik, and Marvin E. Gaines, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1980, Ser. No. 151,707
Int. Cl.³ F04B *1/18*
U.S. Cl. 92—71 **3 Claims**



1. In a compact lightweight multicylinder swash plate compressor of the type having a metallic double-ended piston with piston heads reciprocated in aligned metallic cylinder bores wherein each piston head has a diametrical dimension substantially less than the diametrical dimension of its respective bore to provide a substantial annular space therebetween and wherein a solid seal-support ring of slippery material such as Teflon or the like is expanded over each piston head and contracts into a circumferential groove therein and is sufficiently thick that the memory recovery thereof after further contraction forced by a tool causes the ring to sealingly engage its respective bore immediately after assembly with its piston head therein as the sole support of the piston head with respect to the bore and whereafter the metal of the piston head on opposite sides of the groove is prevented thereby from touching the metal of its respective bore throughout its reciprocation in the bore: the improvement wherein each said groove is formed with a plurality of non-parallel projections which are circumferentially spaced about and project outward from the bottom thereof, said projections projecting sufficiently outward and being configured in non-parallel relationship so that they substantially bite or imbed themselves in the underside of the ring mounted thereover during assembly of the piston heads with the rings thereon in their respective bores whereafter during

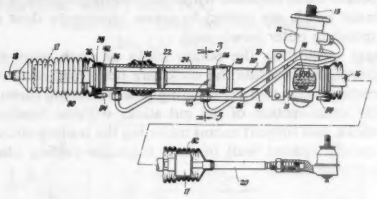
compressor operation the piston is thereby positively prevented from both rotary and longitudinal rubbing movement in its rings to thereby prevent the rings from wearing away the metal of the piston heads at the bottom and shoulders of their groove whereby both sealing and prevention of metal to metal contact between the piston heads and their respective bore is maintained by the rings.

4,351,228

POWER ASSIST RACK AND PINION STEERING GEAR

Raymond J. Schultz, Saginaw, and Michael E. Marr, Bridgeport, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1980, Ser. No. 165,300
Int. Cl.³ F16J *15/18*; F01B *9/00*
U.S. Cl. 92—128 **6 Claims**



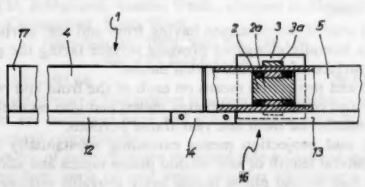
1. A method of installing an annular hydraulic seal of resilient material within a rigid cylindrical body having a predetermined internal diameter greater than the external diameter of said seal comprising the steps of restricting the internal diameter of the cylindrical body at a predetermined station along its length to form a localized internal seal seat having an internal diameter less than the outer diameter of said seal, installing the hydraulic seal on a rod member adjacent an annular piston fixed thereon which slidably fits into said cylindrical body, advancing said rod, piston and seal together in a first linear direction into said cylindrical body until said seal engages said seal seat, subsequently continuing the linear advancement of said rod, piston and said seal in said body so that said seat constricts said seal radially inwardly and securely holds said seal in a fixed position with respect to said body, axially moving said rod and said piston in an opposite linear direction and with respect to said seal to a predetermined location within said body.

4,351,229

FLUID POWER DRIVING UNIT

Kurt Stoll, Lenzhalde 72, 7300 Esslingen/N, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,455
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948204
Int. Cl.³ F16J *11/02, 1/00*
U.S. Cl. 92—128 **4 Claims**



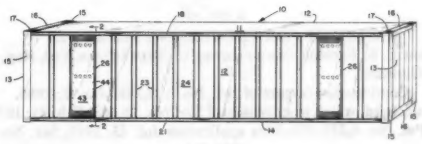
1. In a fluid power driving unit which includes an elongate, hollow cylinder made of a non-magnetic material, a piston supported within said cylinder for movement lengthwise thereof, first means for introducing to and removing from said cylinder a fluid in a manner effecting movement of said piston therein, a runner supported on said outer surface of said cylinder for movement lengthwise thereof, and magnetic means provided on and magnetically coupling said piston and said runner for effecting movement of said runner along said cylinder synchronously with and in response to movement of said piston along said cylinder, the improvement comprising wherein said cylinder includes a plurality of cylinder sections and second means for releasably interconnecting said cylinder sections in an end to end manner, the adjacent ends of respective said cylinder sections overlapping each other and said inner and said outer surfaces of said cylinder being substantially smooth and continuous in the regions of said overlapping ends of said cylinder sections, and including a reinforcing rail section supported on said outer surface of and extending axially along each said cylinder section and guiding said runner and third means for releasably interconnecting the adjacent ends of respective said reinforcing rail sections on adjacent said cylinder sections.

4,351,230

SELF-VENTING CARGO CONTAINER

Laurence R. Brickner, Marathon, N.Y.; David N. Moutner, Spotswood, N.J., and Barbara J. Pratt, Yorktown Heights, N.Y., assignors to Sea-Land Service, Inc., Elizabeth, N.J.

Filed Apr. 20, 1981, Ser. No. 255,421
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—31 **4 Claims**

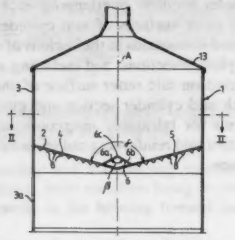


1. A self-venting cargo container for handling temperature and moisture sensitive cargo having bottom, top, side and end walls forming a tight enclosure for retaining bulk cargo therein, one of said end walls being openable for loading and unloading cargo, each of said side walls having at least one self-venting section for admitting and exhausting air into and out of said container, each of said sections having upper, intermediate and lower portions, said upper portion of each section having a series of openings and said intermediate portion having a series of openings for passage therethrough of water condensed from inside the container, baffle means secured to each section above said openings in said upper and intermediate portions to exclude downward water flow from entering said openings, a vent cover having upper, intermediate and lower sectors, said upper and lower sectors of said vent cover having a plurality of openings for air flow therethrough, each of said vent covers being secured in overlapping relation with each of self-venting sections forming a vertical chamber therebetween and a bottom drain opening whereby a chimney effect for induced draft occurs in said vertical chamber producing air circulation vertically in said chamber and into said container to modify the temperature gradient between the container interior and exterior to reduce condensation within the container.

4,351,231
MASH COPPER

Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 255,210
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022050
Int. Cl.³ C12H *1/00*
U.S. Cl. 99—277.2 **8 Claims**



1. A mash copper construction having a body of circular cross-section and a tun bottom, said bottom having two planar bottom portions disposed in mirror-image manner with respect to a first vertical centre plane passing through the copper body and including therebetween an angle between about 140° and 156°; and two gusset portions disposed in mirror-image manner with respect to a second vertical centre plane passing through the copper body and offset by 90° with respect to said first plane and tapering from the periphery toward the centre of the copper bottom, said gusset portions having roof-like inclined surfaces enclosing an angle between about 90° and 130° and a ridge-like upper edge at an angle to the horizontal of between about 3° and 5°.

4,351,232
SYSTEM FOR PROCESSING POTATOES

Hans E. K. Kroenig, Narzissenweg 15, 4010 Hilden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 109,289, Jan. 3, 1980, abandoned, which is a division of Ser. No. 13,463, Feb. 21, 1979, Pat. No. 4,251,555. This application Jul. 23, 1981, Ser. No. 286,151
Int. Cl.³ A23N *7/02, 15/04, 15/12*
U.S. Cl. 99—540 **8 Claims**

1. Apparatus for snipping the ends of raw potato sticks comprising, in combination:

a pair of cutting devices each of which defines an axis of rotation and each of which includes an inner bowl coaxial with and rotatable about its corresponding axis of rotation and an outer coaxially related stationary bowl, each inner and each outer bowl having a peripheral wall, the peripheral wall of each said inner rotatable bowls being spaced inwardly from the peripheral wall of the corresponding coaxially related stationary bowl;

means mounting said cutting devices so that the axis of rotation of a first of said devices is vertical and the other of said devices is overhead of the first and has its axis of rotation disposed at an inclined angle to vertical;

circumferentially spaced walls carried by and extending outwardly from the peripheral wall of each of said inner bowls to define a plurality of circumferentially adjacent rotatable cutting chambers having their outer sides closed by the peripheral wall of the corresponding outer stationary bowl;

a base on each of said outer bowls;

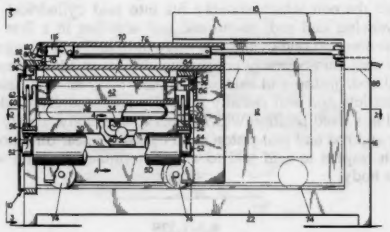
a stationary cutting knife mounted on each stationary bowl in spaced relation from the corresponding base thereof and extending inwardly from the internal surface of the corresponding peripheral wall so as to cut off the ends of potato sticks disposed within said cutting chambers as said inner bowls are caused to rotate relative to their corresponding outer bowls; and

means supporting the potato sticks on both sides of said cutting knife while the sticks are being passed over said cutting knife, thereby creating positive slicing throughout the cross-section of the cut sticks without bending the sticks, said support means including the trailing circumferentially spaced wall of each rotatable cutting chamber carrying sticks.

4,351,233
PRESS

Frank W. Leonard, 4501 Federal Way, Boise, Id. 83705

Continuation of Ser. No. 113,738, Jan. 21, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,467
Int. Cl.³ B30B *15/16*
U.S. Cl. 100—48 **9 Claims**



1. A press construction for forming elongated articles comprising

(a) an upright frame having laterally elongated, vetically reinforced front and rear portions as well as side, top and bottom portions,

(b) first platen means having a laterally elongated pressing surface for supporting elongated articles in the press and having vertical powered movement in pressing operations,

(c) second platen means having front and rear portions and a laterally elongated pressing surface facing the pressing surface of said first platen means,

(d) and projection means on each of the front and rear portions of said second platen means and also on each of the reinforced front and rear frame portions,

(e) said projection means extending substantially the full lateral length of said second platen means and said frame,

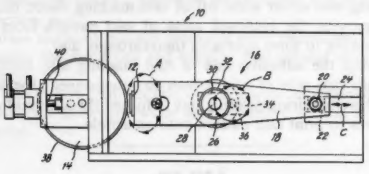
(f) said second platen means being movable relative to said first platen means in a plane parallel with said pressing surface to move between an advanced pressing position in overlapping relation with said first platen means for pressing articles and a retracted position for loading and unloading articles on said first platen,

(g) both of said front and rear projection means on said second platen means in the retracted position of the latter being out of engagement with the projection means on said frame but being disposed in underneath engagement with said front and rear projection means of said frame respectively in the advanced pressing position of said second platen means whereby upward pressing forces of said lower platen means in pressing operations against the second platen means is transferred to said vertically reinforced frame portions.

4,351,234
MARKING APPARATUS WITH ORBITING MARKING HEAD

James E. Keehner, Salem; Samuel A. Linn, Silverton; Marvin L. Kahut, Woodburn; Bobby G. Forrester, Silverton, and Roy E. Bohanan, Salem, all of Oreg., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,003
Int. Cl.³ B41F *17/24*
U.S. Cl. 101—10 **4 Claims**



1. A marking apparatus for marking a continuous succession of spaced-apart articles comprising heat sensitive material, said articles moving at a speed in excess of 1500 inches per minute and said marking being at least four characters in the direction of flow comprising:

an electrically-heated marking head;

backup means positioned opposite the marking head, said backup means comprising a wheel with a resilient surface;

and means for reciprocating the marking head between a withdrawn position and a marking position adjacent said backup means, including means for effecting an overall elliptical movement of the marking head, thereby permitting accurate marking and prolonged contact in the direction of flow between the articles moving continuously past the marking head and said marking head, said means including an orbiting arm, with the marking head mounted on one end thereof and with the opposite end thereof being pivotally connected to a slide adapted for reciprocal movement within a slide channel and a shaft eccentrically attached to a rotating drive means, said shaft being fitted in an aperture in said orbiting arm.

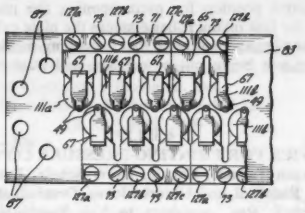
4,351,235
DOT PRINTING MECHANISM FOR DOT MATRIX LINE PRINTERS

Edward D. Bringhurst, Seattle, Wash., assignor to Mannesmann Tally Corporation, Kent, Wash.

Filed Sep. 11, 1980, Ser. No. 186,134
Int. Cl.³ B41J *3/12*
U.S. Cl. 101—93.04 **20 Claims**

12. In a dot matrix line printer wherein a line of dot printing elements are oscillated back and forth along a print line, the improvement comprising:

a plurality of print modules mounted side-by-side along said print line, each of said print modules including a print hammer assembly, each print hammer assembly including a plurality of hammer arms formed of a wide, flat piece of resilient material and a plurality of stiffeners formed of a relatively large bulky mass of magnetically permeable material, one of said stiffeners mounted on the outer end of each of said hammer arms, said stiffeners having anvils located on one face and near the outer ends thereof, said

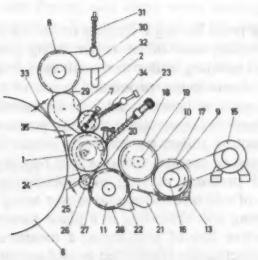


anvils located along said print line, said modules mounted on opposite sides of said print line such that said anvils are interleaved.

4,351,236
COMBINED DAMPENING-INKING UNIT FOR OFFSET PRINTING MACHINES

Hermann Beisel, Walldorf, and Hermann Kraft, Dossenheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heilderberg, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,139
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845932
Int. Cl.³ B41F *7/40, 31/34;* B41L *25/14*
U.S. Cl. 101—148 **4 Claims**



1. Combined dampening-inking unit for offset printing units having an inking unit section and a dampening unit section, the inking unit section being disposed adjacent a rotary plate cylinder and including a first inking roller and at least a second inking roller, as viewed in rotational direction of the plate cylinder, the first and the second inking rollers being engageable with the plate cylinder, means for adjustably mounting the first inking roller and the second inking roller independently of one another, the dampening unit section including a dipping roller, a dampening-medium distributor roller and a metering roller cooperatively engageable with the dipping roller and the dampening-medium distributor roller for supplying dampening medium to the dampening-medium distributor roller, the dampening-medium distributor roller being engageable with the first inking roller for predampening the inking unit and the plate cylinder, comprising an oleophilic roller intermediate the first and the second inking rollers, means for adjusting said intermediate roller independently of the first inking roller simultaneously together with the second inking roller, first means for shifting the first inking roller into a first control position wherein the first inking roller is spaced away from both the plate cylinder and the dampening-medium distributor roller and is connected by said intermediate roller to the inking unit, second means for shifting the first inking roller into a

second control position wherein the first inking roller engages said intermediate roller and is in engagement with the dampening-medium distributor roller for predampening the inking unit, and third means for shifting the first inking roller into a third control position for predampening the plate cylinder wherein the first inking roller engages the plate cylinder while maintaining engagement with the dampening-medium distributor roller and being out of contact with said intermediate roller.

4,351,237

DEVICE FOR PRINTING-PRESSURE CONTROL

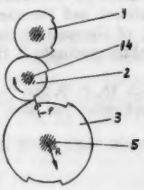
Hans-Jürgen Tappert, Coswig; Horst Schulz, Dresden; Hans Johne, Radebeul, and Albrecht Johne, Dresden, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 5, 1980, Ser. No. 129,886

Claims priority, application German Democratic Rep., Mar. 26, 1979, 211779

Int. Cl.³ B41F *13/34*

U.S. Cl. 101—216 **10 Claims**



1. In a printing press having a feeding roller, an offset roller and a printing roller, said offset roller being positioned in contact with said printing roller and with said feeding roller for printing on sheets being processed, each of said rollers being provided with a bearing, and feed-control means, a control arrangement for controlling printing pressure between two of said contacting rollers comprising a sensor for measuring a bearing pressure exerted within a first bearing of one of said rollers, said pressure varying in dependence upon the angle of rotation of said one roller, said sensor being positioned on said first bearing and extending in a plane passing through the central effective line of said force; a measured pressure value processor electrically connected to said sensor to receive a signal corresponding to the measured pressure value therefrom; an indicator of a desired pressure-value to generate a signal corresponding to said desired pressure value; means for comparing said signal of the measured pressure-value with the signal of the desired pressure-value; and positioning means electrically connected to said comparing means and to a second bearing of a second one of said contacting rollers, said positioning means being operative for receiving a compared signal from said comparing means and positioning said second bearing of said second roller in dependence upon the said angle of rotation and in response to said compared signal thereby adjusting the printing pressure between two rollers arranged in contact with each other.

4,351,238

METHOD FOR SCREEN PRINTING

Charles W. Harpold, 274 Greenbrier Dr., SE., Grand Rapids, Mich. 49506

Filed Sep. 25, 1980, Ser. No. 190,503

Int. Cl.³ B41C *1/14*

U.S. Cl. 101—128.4 **17 Claims**

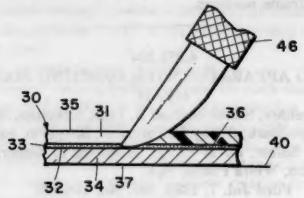
4. In a method for screen printing with a printer having a platen and a porous screen, the improvement comprising:

providing a sheet of masking, sized to cover said porous screen, and including an adhesive coating on a back side thereof with a cover sheet overlying and adhered to the same;

positioning said masking on a work surface cover side up;

scribing a selected pattern on said cover sheet with a pointed instrument so as to form a corresponding indentation in said masking which is visible from the front side of said masking; said pattern including at least one closed area;

positioning said masking front side up on said work surface;



cutting said masking along said indentation;

peeling said cover sheet off of said masking sheet, thereby removing the enclosed areas of said pattern from said masking to form apertures therethrough; and

pressing the adhesive side of said masking into abutment with one side of said screen to interconnect the same, whereby during printing, ink is forced through said apertures to print said pattern onto an article.

4,351,239

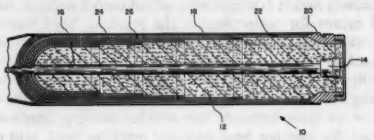
WARHEAD, INCENDIARY

Melvin J. McCubbin, and Clifford T. Johnson, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 553,851

Int. Cl.³ F42B *11/24*

U.S. Cl. 102—364 **2 Claims**



1. In a fragmentation warhead including;

an explosive charge extending along a longitudinal axis,

a casing surrounding said explosive charge and extending concentrically therealong so as to contain the fragmentation warhead,

a plurality of generally cylindrical layers of fragmentation elements arranged between said explosive charge and said casing to extend outer surface thereof in a direction along the longitudinal axis of said explosive charge, each layer having a length different from other layers and arranged with the longest extending layer outermost and adjacent said casing and progressively shorter extending layers concentrically positioned within said longest extending layer with the shortest extending layer innermost, adjacent said explosive charge, the improvement comprising:

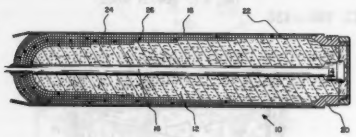
a plurality of rings of zirconium sponge material equal in number to the number of layers of fragmentation elements, each having the same thickness as the layer of fragmentation elements, each having a length along said longitudinal axis greater than a single element, and positioned at the end of each layer to form an extension thereof, whereby the explosive fragmentation of said warhead is accompanied by an incendiary dispersal of pyrophoric zirconium sponge material.

4,351,240

INCENDIARY FRAGMENTARY WARHEAD

Melvin J. McCubbin; Clifford T. Johnson, and Paul E. Cordle, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 553,852
Int. Cl.³ F42B 11/24
U.S. Cl. 102—364 2 Claims



1. A fragmentation-incendiary warhead comprising, in combination;

an explosive section having an axis of symmetry;

a plurality of rows of generally cubical ferrous metal fragments arranged in a patterned array around said explosive section; and

separate distinctly shaped pieces of solid zirconium of very nearly the same size and mass as said cubical steel fragments;

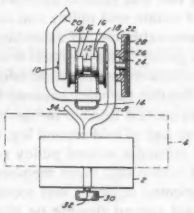
said pieces being intermixed with said cubical fragments for dispersal therewith when said explosive section is detonated.

4,351,241

WORKPIECE STORAGE SYSTEM

John H. Brems, and James T. Graham, both of Birmingham, Mich., assignors to F. Jos. Lamb Company, Warren, Mich., a part interest

Division of Ser. No. 908,941, May 24, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 176,563
Int. Cl.³ B61B 3/00
U.S. Cl. 104—93 4 Claims



1. In a conveyor,

A. a body for carrying load pieces,

B. a downwardly sloping track means including a first portion to carry an unloaded body and a second portion to carry a loaded body,

C. two unpowered primary wheels of different diameters mounted on said body for selectively supporting and guiding said body on and with respect to said track means,

D. retarding means acting between said body and each of said primary wheels to generate a retarding torque substantially proportional to the angular velocity of a said primary wheel,

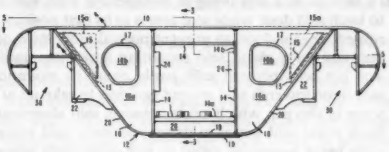
E. said first and second portions of said track means being spatially related relative to said primary wheels to cause the smaller diameter primary wheel to ride on said second portion of said track means when a body is loaded, and to cause the large diameter primary wheel to ride on said first portion of said track when a body is not loaded, thereby creating a different ratio of retarding force to body velocity for a body supported on one of said primary wheels than the ratio of retarding force to body velocity for a body supported on the other of said primary wheels.

4,351,242

RAILWAY CAR TRUCK SIDE FRAME

Howard D. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1980, Ser. No. 122,726
Int. Cl.³ B61F 5/00
U.S. Cl. 105—206 A 1 Claim



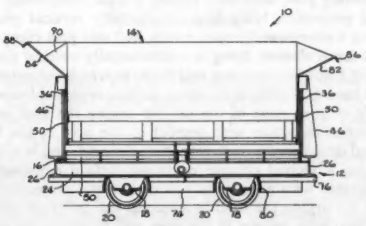
1. A railway car truck side frame comprising: a compression member horizontally extending the length of the side frame; a tension member substantially coextensive with said compression member and spaced therefrom, said tension member having an intermediate horizontal portion merging at opposite ends into diagonally and upwardly and outwardly extending portions; a rectangular bolster frame mounted between said members coextensive with said intermediate horizontal portion of said tension member; spaced apart shear webs welded between said compression member, said diagonally and upwardly and outwardly portions of said tension member and said bolster frame to form a box-beam as the primary structural unit for the side frame, said shear webs having aligned openings therethrough; a flange attached to the periphery of said openings and joining said shear webs, welds joining the main structural elements are so disposed to be stressed in shear rather than tension or compression; coextensive reinforcing members welded to said box along the diagonally and upwardly and outwardly extending portions of said tension member and the side plates; and separate stiffeners welded in a longitudinal array to the intermediate horizontal portion of the tension member.

4,351,243

PIVOTED RAILWAY HOPPER CAR DOOR LATCH

Cornelis Brouwer, Potchefstroom, South Africa, assignor to Rotaque (Proprietary) Limited, Potchefstroom, South Africa

Continuation of Ser. No. 903,300, May 5, 1978, abandoned. This application Sep. 18, 1980, Ser. No. 188,413
Int. Cl.³ B61D 7/04, 7/18, 7/30
U.S. Cl. 105—241.2 5 Claims



1. A bottom discharge hopper structure comprising

(a) a chassis frame;

(b) a body mounted on said chassis frame and bounded by two longitudinally extending side walls, said side walls

both sloping downwardly and inwardly so as to converge with one another to from a bottom discharge opening;

(c) a single door hung from pivot structures above said chassis frame and serving to close said opening, said door comprising two end plates, an elongated plate of arcuate cross-section joining said end plates, and a first abutment surface;

(d) a tipping arm pivotally mounted on said door and having a second abutment surface, said arm having a first position with respect to said door in which first position said abutment surfaces are spaced apart and a second position with respect to said door in which second position said abutment surfaces are in engagement;

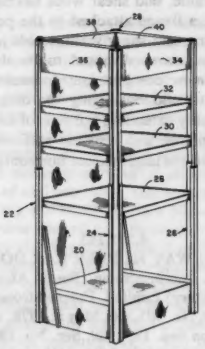
(e) a face on said arm being in engagement with said frame to latch said door while said arm is in its first position with respect to said door, to prevent pivotal movement of said arm and door about said mounting structures until said arm has been pivoted sufficiently about its mounting on said door towards said second position to take up at least some of the gap which exists between said abutment surfaces while said arm is in its first position, said elongated plate being generated about an axis offset with respect to the axis of said pivot structures in such manner that said elongated plate moves both downwardly and laterally with respect to said side walls, thereby to cause a gap of progressively increasing width to be created between said door and said walls during opening.

4,351,244

SHELVING SYSTEM

James M. Suttles, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.

Filed Jan. 29, 1980, Ser. No. 116,585
Int. Cl.³ A47B 3/06
U.S. Cl. 108—107 **16 Claims**



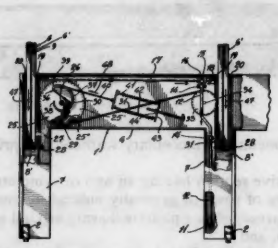
1. A system of shelving comprising a shelf, and an upright supporting post, said shelf having a hook comprising a sheet metal projection lying in a substantially vertical plane and having a downwardly open notch, and said post comprising a sheet metal element lying in a substantially vertical plane and having a slot for receiving said hook; in which the notch of the hook has a first oblique camming surface engageable and cooperable with an edge of the slot for urging the shelf in a first horizontal direction with respect to the post as the hook is moved downwardly with respect to the post, and in which the slot has a second oblique camming surface engageable and cooperable with an edge of the sheet metal projection of the hook for urging the shelf in a second and different horizontal direction with respect to the post, and in which the post and shelf also have mutually engageable means for limiting the relative movement of the post and shelf in both of said first and second directions, said mutually engageable means being positioned so that they first come into engagement while said edges are in engagement with intermediate portions of their cooperating camming surfaces, whereby, upon downward movement of the shelf, said mutually engageable means become tightly engaged, and the shelf and post are rigidly secured together.

4,351,245

COUNTERWEIGHT SYSTEM

Joseph L. Laporte, 420 E. Principale St., St.-Ambroise-de-Kildare, Quebec, Canada (J0K 1C0)

Filed Sep. 4, 1980, Ser. No. 184,039
Int. Cl.³ A47B 9/02
U.S. Cl. 108—136 **1 Claim**



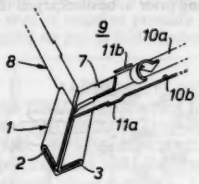
1. A drafting table comprising a frame of inverted U-shaped hollow construction having a top transverse bight member and two upright sides downwardly depending from the ends of said bight member; a leg assembly including first and second legs vertically displaceable within the respective sides of said U-shaped frame and upwardly protruding through said bight member; a table top mounted on the upper ends of said first and second legs and overlying said bight member; a horizontal pivot shaft extending transversely through said bight member and mounted therein adjacent said first leg; a first pulley having a cylindrical peripheral wall close to said first leg and a pair of spaced side walls mounted on said shaft; a cam member secured to one of said side walls of said pulley; said cam member having a spiral shaped cam surface progressively distant from the rotational axis of said pivot shaft; first and second flexible ties trained in the same direction around said pulley and each having one end portion extending through said peripheral wall and within said pulley and attached to the latter by a common removable tie pin extending through said side walls of said first pulley, the peripheral wall of said first pulley guiding said first flexible tie alongside said first leg, the other end of said first flexible tie being secured to the lower end of said first leg; said second flexible tie having its other end secured to the lower end of said second leg; said second flexible tie being trained around a second pulley rotatively and transversely mounted within said bight member, spaced from said pivot shaft and located adjacent said second leg; said second pulley guiding said second flexible tie alongside said second leg, said second flexible tie extending directly from said second pulley to said first pulley within said bight member; the points of tangential contact of said first and second flexible ties with the peripheral wall of said first pulley being angularly spaced from each other around said first pulley; a third flexible tie having one end trained around said cam surface and secured to said first pulley by said common tie pin; the other end of said third flexible tie being fastened to at least one tension coil spring which in turn is secured to said frame within said bight member at the opposite end of said tension spring, whereby the increasing force exerted by said tension spring on said member as it stretches is compensated by the decreasing lever arm of the point of tangential contact of said third flexible tie on said cam surface as said cam member rotates between two limit positions so as to counterbalance said table top and legs at any adjusted position of said table top; and tension adjustment means for said tension spring, said inverted U-shaped hollow frame defining a space between said upright sides which is completely free of any obstruction.

4,351,246

TEMPORARY DISPLAY STAND FOR MERCHANDIZING

Ferris L. Hutchins, Jr., Doraville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 25, 1980, Ser. No. 181,261
Int. Cl.[3] A47B 3/06
U.S. Cl. 108—156 7 Claims



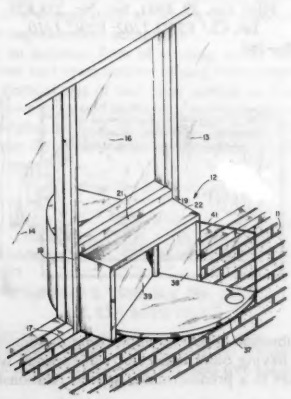
1. A display structure comprising the combination of a corner post unit and a shelf unit having a corner portion connected to said corner post unit, at least one of said units being formed from a foldable sheet material, and wherein the other of said units is provided with connecting means for attachment with cooperating means provided by said one unit, the connecting means comprising projecting arms and the cooperating means comprising a retaining sleeve to receive each of said arms, each retaining sleeve being formed by a portion of said one unit folded to provide a double ply thickness of material, said shelf unit being formed from a foldable sheet material and comprising a support surface and an integral peripheral skirt depending therefrom, said arms being provided on adjacent sides of said corner post unit and being received along the peripheral skirt of said shelf unit, said peripheral skirt having an outer skirt section and an overlapping inner skirt section folded over to provide said retaining sleeve, and a series of mating tabs and slot connector means provided by said shelf unit to retain said inner and outer wall sections in their overlapped relationship, the tabs of said connector means being integrally formed at spaced locations along said inner wall sections and the slots of said connector means being formed at correspondingly spaced locations in said support surface.

4,351,247

PASS-THROUGH FOR DRIVE-UP WINDOW

Larry G. Clark, 5532 Hollister Dr., Indianapolis, Ind. 46224

Filed Aug. 18, 1980, Ser. No. 178,780
Int. Cl.[3] E06B 7/32; E05G 7/00
U.S. Cl. 109—19 8 Claims



1. In a building wall, a through-the-wall transfer apparatus for transactions between a business employee on one side of the wall and a customer on the other side of the wall, the apparatus comprising:

a housing mounted in the building wall;

a shelf for swinging in a horizontal plane from a rear position where it is open to the employee's side of the building wall, through an intermediate position where it is normally disposed when not in use, to an open position where it is accessible to the customer at the customer's side of the building wall;

upstanding walls at two sides of the shelf to preclude direct access from the customer's side of the building wall to the employee's side of the building wall for any position of the shelf;

hinge means mounted in said housing and having a vertical pivot axis, said shelf being mounted to said hinge means;

a part-cylindrical wall in said housing and having its cylindrical axis colinear with said pivot axis, said part-cylindrical wall extending from the space outside the customer's side of the building wall to the space inside the employee's side of the building wall;

hinge pin receiver means in said housing and receiving said hinge means thereon;

stop wall means in said housing adjacent said hinge means;

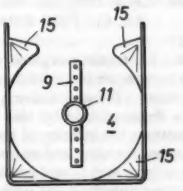
one of said upstanding walls being abuttingly engageable with said stop wall means when said shelf is swung inwardly through said rear position, to stop rotation of said shelf with the two upstanding walls facing the said inside space, and the other of said upstanding walls thereupon cooperating with said part-cylindrical wall and the top of the housing and said shelf to preclude customer access through said transfer apparatus from the customer side to employee side of the building wall.

4,351,248

HEATING BOILER FOR THE COMBUSTION OF BALED STRAW

Hans Viessmann, Im Hain, 3559 Battenberg, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,760
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034668; Jan. 9, 1981, 8100295[U]; Mar. 14, 1981, 3109910; Mar. 14, 1981, 3109915; Mar. 14, 1981, 3109917
Int. Cl.[3] F23J 1/06
U.S. Cl. 110—170 16 Claims



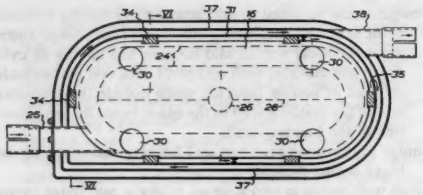
1. A heating boiler for the combustion of baled straw, comprising an enclosed straw feed channel, provided with conveyor means, communicating with a combustion chamber having a combustion zone adjacent the rear wall of the combustion chamber, a flue gas heat exchange chamber above the combustion chamber and in communication with a flue gas vent, an ash collecting pit below the combustion chamber, a horizontal floor disposed between the combustion chamber and the ash collecting pit and having a slot adjacent the rear wall of the combustion chamber for passage of ash from the combustion zone into the ash collecting pit and for intake of primary air into the combustion zone, an ash stripper assembly extending from the rear wall of the combustion chamber and movable in a vertical plane to strip ash from the surface of a

straw bale being combusted in the combustion zone, and at least one secondary air intake in the rear wall of the combustion chamber.

4,351,249
REACTOR

Allan Inovius, Building le Continental, Block A, Monte Carlo, Monaco

Division of Ser. No. 31,314, Apr. 19, 1979, Pat. No. 4,262,609. This application Jan. 21, 1981, Ser. No. 226,641
Int. Cl.³ F23B *5/00*
U.S. Cl. 110—210 **4 Claims**



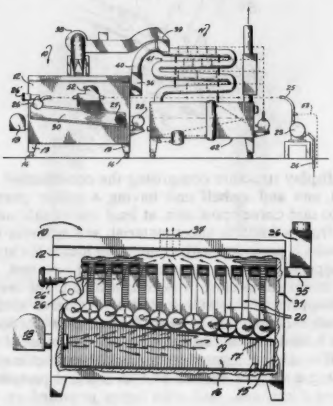
1. Reactor for catalytic oxidation of carbon monoxide and hydrocarbon compounds in hot combustion gases, comprising a box with side walls and end walls and a partition wall dividing the space between the end walls into two chambers, at least one of said walls containing a material catalyzing oxidation of carbon monoxide and hydrocarbon compounds, said partition wall containing an annular channel, an inlet for the hot combustion gases being connected to said channel, a central opening in said partition wall connecting said chambers, at least one slot in said partition wall connecting said central opening with said annular channel along at least part of the length of said channel, and said box being provided, at a distance from said central opening of said partition wall, with outlet means connected to said chambers.

4,351,250
PROCESS AND APPARATUS FOR RECYCLING ORGANIC WASTES

Joseph A. Chartrand, St. Hugues, County of Bagot, St. Hugues, Canada (J0H 1N0), and Irénée Perreault, 1025 Lapierre St., St. Hyacinthe, Canada (J2T 3N6)

Filed May 4, 1981, Ser. No. 259,833
Int. Cl.³ F23G *5/04*
U.S. Cl. 110—227 **2 Claims**

1. An apparatus for treating organic wastes having a high liquid content to recuperate the solid contents thereof in dried condition, comprising a furnace defining an enclosed space, a series of troughs disposed side by side and mounted in the furnace and separating the interior of the furnace into an underlying combustion chamber and an overlying vaporization chamber, means to burn fuel in said combustion chamber, said troughs serially communicating one with another and containing the organic waste in the furnace in open communication with the overlying vaporization chamber, each trough, except the last trough of the series, having its downstream end in lateral communication with the upstream end of the next trough of the series, the last trough of the series having its downstream end opening outside said furnace for discharge of the dried solid content of the organic waste, means to discharge untreated solid waste in the first trough of the series, a conveyor system mounted in the trough and operatively conveying the organic waste in continuous flow for vaporization of fluidizing content and separation of the latter from the solid content, said conveyor system including a plurality of endless screw conveyors extending longitudinally into the troughs respectively, power means to drive the endless scrw conveyors to convey the organic waste from the upstream end to the downstream end of each trough, paddles fixed to the downstream end of each endless screw conveyor, except the endless screw conveyor in the last trough of the series, for pushing the organic waste from one trough to the next through said lateral communication, a heat exchanger ducting extending in the vaporization chamber over the organic waste in the troughs and including an inlet communicating with the combustion chamber, and an outlet located outside said furnace, whereby the hot combustion gases flow from said combustion chamber through said ducting prior to be discharged through said outlet

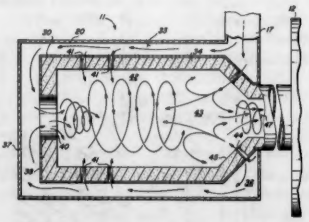


to provide additional heating of the vapors in the vaporization chamber, said furnace further having an outlet at the top of said vaporization chamber for the evacuation of vaporized fluidizing content, the troughs are horizontally disposed in their longitudinal direction, but are arranged at lowering levels relative to one another serially from an uppermost upstream trough to a lowermost upstream trough, the top of the side walls of said troughs being also arranged at lowering levels, whereby organic wastes in an obstructed trough can spill over laterally into an adjacent downstream trough.

4,351,251
COMBUSTION APPARATUS

David F. Brashears, Oviedo, Fla., assignor to Mechtron International Corp., Orlando, Fla.

Filed Jun. 29, 1981, Ser. No. 278,825
Int. Cl.³ F23D *1/02*; F23C *1/10*
U.S. Cl. 110—261 **9 Claims**



6. A combustion apparatus comprising in combination:
a burner having outer and inner walls spaced with spacing members in a predetermined spaced relationship to each other;
said inner wall forming a combustion chamber thereinside;
solid fuel input means passing through said burner outer and

inner walls for directing fuel into said combustion chamber;

a source of air directed into the space between said inner and outer walls;

a plurality of passageways through said inner walls for directing air from said source of air through said openings into said combustion chamber, said plurality of passageways including angled passageways, staggered in said inner wall and directed into the primary burn zone; and

reverse air jets for directing air through one end of inner wall into an area of negative pressure generated by said staggered angled air jets in said combustion chamber.

4,351,252

METHOD FOR TREATING WATER SOLUTION OF WASTE MATERIAL CONTAINING SALT OF SMELT-WATER EXPLOSION CHARACTERISTIC

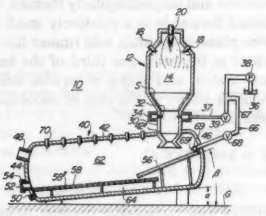
Mamoru Shindome; Takanori Yanagita; Takanori Nakamura, and Hiroyuki Otsuji, all of Nobeoka, Japan, assignors to Asahi Engineering Co. Ltd., Osaka, Japan

Division of Ser. No. 21,538, Mar. 19, 1979, Pat. No. 4,280,982. This application Feb. 26, 1981, Ser. No. 238,326

Claims priority, application Japan, Mar. 23, 1978, 53-32302; Mar. 23, 1978, 53-32303

Int. Cl.³ F23G *5/12*

U.S. Cl. 110—346 **1 Claim**



1. An improved method of treating a water solution of a waste material containing a salt having smelt-water explosion characteristics, said method including the steps of spraying the waste solution into an open-bottomed incinerator, producing a combustion of a fuel in said incinerator to heat the spray of the waste solution to a temperature at which the water in the sprayed solution is vaporized and the salt contained in the sprayed solution is fused, causing at least a part of the fused salt to form a layer on the inner surface of said incinerator, allowing the fused salt in said layer to flow downwardly by gravity through the open bottom of said incinerator, and cooling the fused salt to a temperature at which no explosion occurs, wherein the improvement comprises:

establishing an inclined flow of cooling water which is disposed below said open bottom of said incinerator and intersects the vertical axis of said open bottom so that the fused salt falls down onto said inclined water flow and which is of a depth ranging from 05. to 5.0 mm, the angle of inclination of said water flow relative to the horizontal ranging from 5° to 60°.

4,351,253

TREE PLANTER AND TRAILER

E. Arthur Dahlquist, 1404 E. Crystal Lake Rd., Burnsville, Minn. 55337

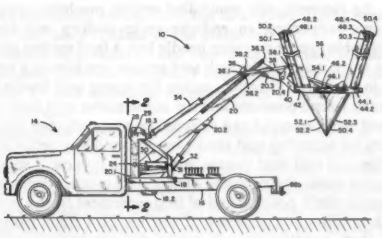
Filed May 1, 1980, Ser. No. 145,671

Int. Cl.³ A01G *23/02*

U.S. Cl. 111—2 **10 Claims**

1. Tree planting system for excavating, transporting and planting a plurality of trees or shrubs, said tree planting system comprising:

a. vehicular tree planting means including a frame, an engine mounted on said frame, two axles of wheels axially mounted on said frame, a transmission for one of said axles, said engine connected through said transmission to one axle of said wheels, hydraulic power means for providing pressure of hydraulic fluid connected to said engine, and hydraulic control means connected to said hydraulic power means for controlling hydraulic pressure, hoist frame means affixed to said frame, hoist frame means including a longitudinal boom including a rectangular cross section affixed at one end to a self-aligning bushing secured and positioned in a bottom position of said hoist frame means, a boom hoist hydraulic cylinder pivotally connected between said hoist frame means and a lower mid portion of said boom with self-aligning bushings at each end thereof, a forward-aft tilt hydraulic cylinder connected between said hoist frame means and a movable pivot point means at an other end of said boom on an upper portion of said boom with self-aligning bushings at each end, said pivot point means riding on opposing wheels on opposing rails positioned on, at and over a portion of said other end of said boom, a boom twist machine hydraulic cylinder and a boom sideswing hydraulic cylinder for providing vertical and horizontal motion to said boom respectively, said boom machine and sideswing cylinders connected by a bar linkage means between said hoist frame means and to said boom with self-aligning bushings between said linkage, said boom and said frame means, a digger frame means pivotally mounted to said other end of said boom and connected to said movable pivot point means by a bar linkage, said digger frame means including four hydraulic spade cylinders,



actuated spades spaced about said digger frame means and connected to said spade cylinders and two hydraulic gate cylinders connected between said digger frame means and gates positioned in said digger frame means and connected to said two cylinders for opening and closing said gates about a tree, said hydraulic cylinders of said boom, said forward-aft, said boom twist machine, said boom sideswing, said spade cylinders and said gate cylinders connected to said hydraulic control means for individual actuation of each cylinder by said hydraulic control means; and,

b. trailer including a longitudinal frame means, said frame means including tandem axially mounted wheels thereto, said trailer frame means pivotally coupled to said vehicular tree planter means, a plurality of cone-shaped continuous wall containers, each bottom of said containers truncated, each of said containers pivotally mounted on bearing means with horizontal bearing axes affixed to said trailer frame means for movement between a substantially vertical position to a substantially angular position when said vehicle means and said trailer are in vehicular motion, means on said trailer frame means for locking each of said containers into said angular position, said trailer including forward and rearward positioning support jacks respectively connected to said frame means whereby said spades excavate said trees and deposit said trees into said truncated cone-shaped containers, said means for locking said cone-shaped containers into said angular position during vehicular transport of said trees in said containers said trailer being disconnected from said vehicular tree plant-

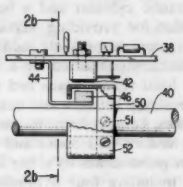
ing means and supported in a fixed position by said jacks during removal of a tree from one of said cone-shaped containers during removal and planting in ground, and said boom being raisable and movable to a height for depositing and removing said tree from above a top height of one of said truncated cone-shaped containers, said continuous wall of each container provides for securing the root ball of each tree and said truncated bottom provides an opening for drainage of water and dirt particles thereby providing transportation for a plurality of mature trees in said trailer by said vehicular tree planting means.

4,351,254

SEWING MACHINE NEEDLE POSITIONING

Jack Brown, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 8, 1981, Ser. No. 271,445
Int. Cl.³ D05B *3/02, 69/22*
U.S. Cl. 112—158 E **5 Claims**



1. An electronically controlled sewing machine comprising a frame supporting an endwise reciprocatory and laterally oscillatable needle carrying needle bar, a feed system for feeding a work material through said sewing machine at a selected rate in a selected direction, means for urging said needle bar to selected lateral positions and for constraining said feed system to feed work material at a selected rate in a selected direction, means for actuating said needle bar into endwise reciprocatory motion and said feed system into feeding motion, a solid state memory means for retaining digital code words representative of needle stitch position and of feed increment from a previous stitch position in a sequence of stitches for a stitch pattern, an arm shaft position sensing means for sequentially releasing needle position and feed increment information from said memory to said urging and constraining means substantially at opposite extremes of said endwise reciprocatory motion of said needle bar for implementing said stitches to form a pattern, means for choosing one of a needle up and needle down position, means responsive to a signal from said choosing means for initiating slow speed operation of said actuating means, and means for fast stop braking of said actuating means in response to said arm shaft position sensing means sensing the position chosen by said choosing means.

4,351,255

ICE-BREAKING SHIP

Bengt Johansson, Calgary, Canada; Arno Keinonen, Kerava, and Eero Mäkinen, Espoo, both of Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Continuation-in-part of Ser. No. 826,674, Aug. 22, 1977, abandoned, which is a continuation of Ser. No. 594,491, Jul. 9, 1975, abandoned. This application Dec. 27, 1978, Ser. No. 974,108
Int. Cl.³ B63B *35/08*
U.S. Cl. 114—41 **11 Claims**

1. A ship having efficient ice-breaking properties, a basically wedge-formed stem portion and a drive machinery driving a number of submerged propellers, the beam of said ship, at its design water line, being at least 10 m and the power of its drive machinery being adapted to the beam of the ship in accordance with the following formula:

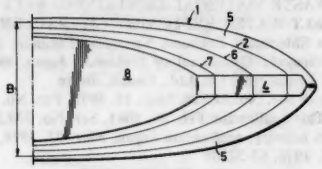
$$P \geq 740 + 45(B - 10)1.5,$$

wherein

P = the total maximum driving power output of said machinery, in kW, measured at the shafts of said propellers,

B = the maximum beam of the ship at its design water line, in meters;

the improvement comprising a modification of said basically wedge-formed stem portion including a truncation thereof, at least within an area between the design water line of the ship and half its draft, whereby a runner-like front portion is formed at a position suitable for striking and bending downwards level ice, said runner-like portion being a smooth surface and being



several times longer than it is broad when measured in its lengthwise direction and perpendicularly thereto, respectively, and being inclined forwards in a relatively small angle to the design water line plane of the ship, said runner-like portion also having a width of at the most one third of the beam B of the ship, as defined above, and being otherwise adapted to the general ice-breaking ability of the ship in accordance with the following formula:

$$W = (0.02 \text{ to } 0.08)(P/B)0.63,$$

wherein

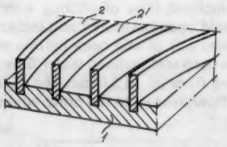
W = the width of said runner-like portion, in meters, and P and B are as defined above.

4,351,256

METHOD FOR MANUFACTURE OF A BOAT DECK HAVING A SURFACE OF ADJACENT STRIPS, AND A DECK MANUFACTURED ACCORDING TO THE METHOD

Sven A. Jönsson, Nykarlebygatan 49, Spanga, Sweden (S-163 26)

Filed Feb. 11, 1980, Ser. No. 120,350
Claims priority, application Sweden, Feb. 19, 1979, 7901461
Int. Cl.³ B63B *3/00, 5/00*
U.S. Cl. 114—85 **10 Claims**



1. A method for the manufacture of a boat deck having a surface of spaced deck strips, comprising providing a fixture having a base plate and spacing members thereon in spaced relationship for separating adjacent deck strips from each other, inserting said strips into the spaces between said spacing members and against said base plate, forming said strips into a longitudinally extending curved configuration corresponding to the desired longitudinally extending curved configuration of a fore-and-aft half of the deck surface to which the deck is intended to be attached, applying a bonding means to the free

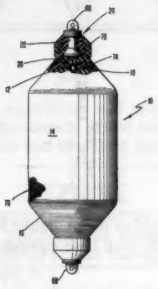
longitudinally extending surfaces of said strips opposite said base plate, and bonding a joining and supporting member to said free longitudinally extending surfaces of said strips.

4,351,257

MARINE FENDER

Louis S. Brown, Jr., Stephens City, Va., assignor to Seaward International, Inc., Falls Church, Va.

Filed Jan. 26, 1981, Ser. No. 228,355
Int. Cl.³ B63B *59/02*
U.S. Cl. 114—219 **20 Claims**



1. A marine fender, comprising:

(a) a resilient core for absorbing energy upon repeated compression having a cylindrical central portion and opposed end portions each tapering to a truncated cone shape and having an axial bore;

(b) a fitting disposed at each said end portion including a tubular central member disposed coaxially with said axial bore, a truncated cone-shaped annular seat integral with said central member cooperating with the axially adjacent end portion to extend the cone shape of the adjacent end portion to said central member, and annular flange means secured to said central member;

(c) flexible strength means disposed in said axial bore and the bores of said opposed central members cooperating with said flange means of each said fitting for interconnecting said fittings and adjustably biasing said fittings axially toward each other;

(d) a flexible, elastomeric skin integrally encasing said core and the central member and seat of each said fitting; and

(e) an overlapping web of elongated reinforcing fibers embedded in said skin integrally encircling said core and the annular seat of each said fitting, said web distributing impact loads over the surface of said core and conducting forces of impact loads to said fittings.

4,351,258

METHOD AND APPARATUS FOR TENSION MOORING A FLOATING PLATFORM

Donald R. Ray, and Riddle E. Steddum, both of Houston, Tex., assignors to The Offshore Company, Houston, Tex.

Continuation-in-part of Ser. No. 96,075, Nov. 20, 1979, Pat. No. 4,281,613, which is a continuation of Ser. No. 827,145, Aug. 24, 1977, abandoned. This application Apr. 9, 1980, Ser. No. 138,478
Int. Cl.³ B63B *21/50*
U.S. Cl. 114—230 **17 Claims**

1. A tension mooring system for a floating platform having an upper deck and a plurality of buoyancy columns extending downwardly from the deck, said mooring system comprising:

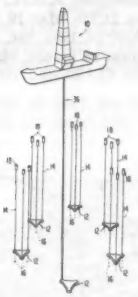
anchor means positioned upon the bed of a body of water;

permanent mooring lines secured to said anchor means and extending upwardly;

buoyancy means connected to the upper ends of said permanent mooring lines at a location below a zone of high corrosive, high oxygen content water adjacent to the surface of the body of water, said connecting location further being below the lowest portion of the floating platform, and said permanent mooring lines being dimensioned to maintain said buoyant means in a submerged posture below the lowest portion of the platform;

sacrifical mooring means connected to a submerged upper portion of said buoyancy means and extending upwardly therefrom and being connected to the platform, said sacrificial mooring means comprising,

a plurality of sacrificial mooring lines, each of said sacrificial mooring lines extending upwardly from said buoyancy means and longitudinally and slidably extending through a corresponding interior column in a downwardly extending buoyancy column of the platform;



first means connected to one end of each of said sacrificial mooring lines for releasably connecting said one end of each of said sacrificial mooring lines to said buoyancy means; and

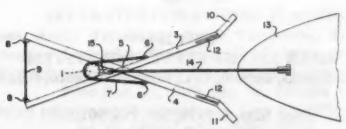
second means connected to the other end of each of said sacrificial mooring lines for releasably connecting the other end of each of said sacrificial mooring lines to the deck of the platform, such that, upon damage to a sacrificial mooring line, the line may be selectively released from the buoyancy means, drawn up through an interior column in a corresponding leg of the platform and replaced.

4,351,259

SINGLE POINT MOORING AND DIRECTIONAL FENDER

René Loire, Houston, Tex., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Filed May 5, 1980, Ser. No. 146,609
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—230 **7 Claims**



1. A single point mooring with a directional fender comprising a dolphin, a pair of buoyant fender bars floating in the water and crossing adjacent the dolphin, and extending beyond the dolphin on the side opposite to the point of crossing, said fender bars being in contact with the dolphin at least when a vessel is being restrained by the bars, said fender bars being freely rotatable relative to the dolphin and vertically movable with the tide relative to the dolphin, and resilient yielding means extending between the bars on the opposite side of the

dolphin from the point of crossing and yieldingly resisting spreading apart of the points where the yielding means are attached to the fender bars.

4,351,260

ARRANGEMENT FOR MOORING A FLOATING BODY SUCH AS A SHIP

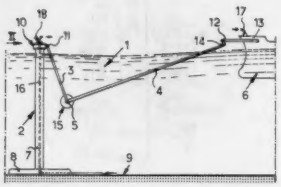
Samuel Tuson, Mesnil-le-Roi, and Robert Vilain, Maisons-Alfort, both of France, assignors to Entreprise d'Equipements Mecaniques et Hydrauliques, E.M.H., France

Continuation of Ser. No. 21,716, Mar. 19, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 256,984

Claims priority, application France, Mar. 24, 1978, 78 08760

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **6 Claims**



1. A system for mooring a ship to a mooring device, the latter being constituted by a column on the top end of which a mooring head is rotatably mounted in coaxial relation thereto, comprising a pair of lever arm sets, each lever arm set being independent from and unconnected to the other lever arm set and including a first lever arm pivotally connected directly to the ship and a second lever arm pivotally connected to said rotatably mounted mooring head with said first and second lever arms being pivotally connected to each other, and wherein each of said lever arm sets is located on a respective side of the longitudinal axis of the ship; and first and second counterweights, each counterweight being secured to one of said first and second lever arms of a respective lever arm set at an end region thereof adjacent to the other lever arm, so that said counterweights are continuously submerged in the sea water to create a stable equilibrium position with a self-acting biasing force urging the system to the equilibrium position.

4,351,261

RISER RECOIL PREVENTER SYSTEM

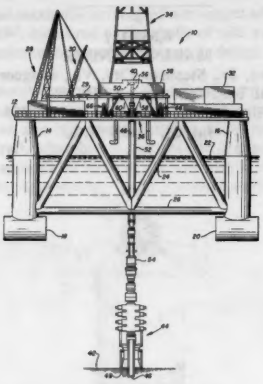
Forrest E. Shanks, DeSoto, Tex., assignor to Sedco, Inc., Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,520

Int. Cl.³ B63B *35/44*

U.S. Cl. 114—264 **5 Claims**

4. In a tensioner assembly for applying a tension load to a marine riser connected to well head equipment and extending to a floating platform in an offshore production site, the tensioner assembly being of the type including a hydraulic cylinder having a housing, a piston dividing the housing into a high pressure hydraulic chamber and a low pressure hydraulic chamber, and a rod attached to the piston for applying a tension load to the marine riser, the combination with the hydraulic cylinder of a reservoir of compressed gas and valve means connected intermediate the reservoir and low pressure chamber for selectively applying a pneumatic over hydraulic load to



the piston in opposition to the hydraulic load when the riser is disconnected from the well head equipment.

4,351,262

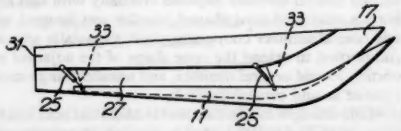
BOAT HULL

Leslie N. Matthews, 9 Boscombe Ave., City Beach, W.A., Australia

Filed Feb. 15, 1980, Ser. No. 121,871

Int. Cl.³ B63B *1/22*

U.S. Cl. 114—284 **10 Claims**



1. A boat hull comprising a pair of substantially parallel hulls extending longitudinally from the bow to the stern of the boat hull, a bridge portion rigidly connecting said hulls together, an intermediate hull portion provided beneath the bridge portion and extending between said parallel hulls and over at least a part of the length thereof, and connecting means connecting the intermediate hull portion to the boat hull, comprising first movement means to positively raise and lower the intermediate hull portion relative to the bridge portion and second movement means to move the intermediate hull portion fore and aft relative to the bridge portion.

4,351,263

APPARATUS FOR SENSING BARE METAL ON A MOVING STRIP OF INSULATIVELY COATED CONDUCTIVE MATERIAL

Larry L. Rarig; Raymond A. Alleman, both of Lancaster, and Dennis L. Miller, Ephrata, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,450

Int. Cl.³ G01R *19/00*

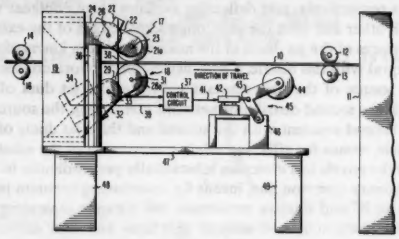
U.S. Cl. 118—665 **12 Claims**

1. Apparatus for sensing bare metal on a moving strip of substantially insulated conductive material comprising:

first sensor means including a first plurality of electrical contacts arranged to rest against one side of said strip;

second sensor means including a second plurality of electri-

cal contacts arranged to rest against the other side of said strip, the contacts of said first and second sensors being electrically separated from one another by said strip when



the insulating material on said strip is acceptable and at least some of the contacts of said sensors being electrically connected when said insulating material is unacceptable.

4,351,264

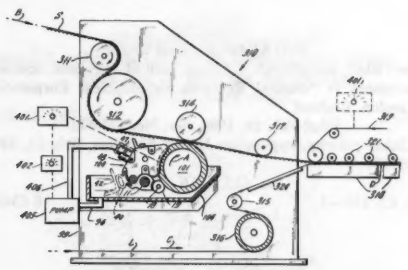
ADHESIVE METERING DEVICE

Stephen S. Flaum, Brooklyn, and Martin J. Leff, New York, both of N.Y., assignors to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Continuation of Ser. No. 22,141, Mar. 20, 1979, abandoned. This application Jan. 5, 1981, Ser. No. 222,754

Int. Cl.³ B05C *1/08*

U.S. Cl. 118—203 **17 Claims**



1. Fluid metering means including a fluid carrying cylinder for applying a fluid film to a workpiece element moving relative to said cylinder; said fluid carrying cylinder being mounted for rotation on its relatively stationary cylindrical axis; shoe means extending parallel to said cylindrical axis; said fluid carrying cylinder having an outer cylindrical surface and said shoe means having a side confronting a portion of said cylindrical surface; a fluid cavity extending generally parallel to said cylindrical axis; said fluid cavity being formed by a depression in said side of said shoe means and being partially bounded by a portion of said cylindrical surface; first means engaging said cylindrical surface while said cylinder rotates and sealing said fluid cavity along its upstream edge; a fluid distribution slot partially bounded by said cylindrical surface and positioned along the downstream edge of said fluid cavity; said slot providing the sole opening through which fluid exits from said cavity; means movably mounting said shoe means to permit said fluid distribution slot to vary in thickness; biasing means urging said fluid distribution slot to close; a supply of essentially incompressible fluid; delivery means to deliver fluid under pressure from said supply to said fluid cavity at a known rate which is substantially independent of pressure in said fluid cavity and thereby create pressure within said fluid cavity urging said fluid distribution slot to open; said shoe means assuming an equilibrium position, under the control of opposing forces generated by said biasing means and said delivery means, whereby fluid is forced from said cavity through said slot to form a controlled fluid film on said cylindrical surface of said fluid carrying cylinder with said fluid film, without doctoring, being of a character suitable for application in final usable form directly to a workpiece element; and means acting independently of fluid viscosity and pressure variations over substantial ranges to synchronize operation of said delivery means with rotational speed of said fluid carrying cylinder; said delivery means maintaining said fluid cavity filled with fluid whereby, independently of fluid viscosity and rotational speed variations over substantial ranges, fluid is forced from said cavity through said slot at a rate equal to the rate at which said delivery means delivers fluid to said cavity.

4,351,265

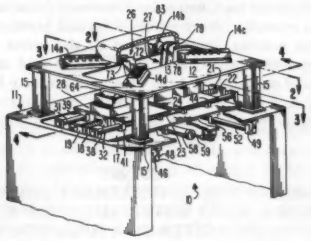
SYSTEM FOR APPLYING A LIQUID TO THE STUDS OF A COLOR KINESCOPE FACEPLATE PANEL

Merle E. Hertzler, Elverson, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,973

Int. Cl.³ B05C *1/02, 7/06*

U.S. Cl. 118—211 **10 Claims**



1. A system for automatically applying a liquid to at least one selected area on the inside surface of kinescope faceplates of various sizes comprising:

means for stationarily holding various sizes of kinescope faceplates;

at least one mounting member arranged for movement with respect to and parallel to the plane of said faceplate holding means, said mounting member including a reservoir of said liquid and a liquid applicator arranged in the proximity of said reservoir;

first means for moving said mounting member relative to said holding means and parallel to one axis of said faceplate; and

second means for moving said mounting member and said first means for moving perpendicular to said one axis.

4,351,266

APPARATUS FOR DIPPING PLATING

Masato Ando, Yokohama; Kenji Yamamoto, Komae, and Kazuhiro Taniguchi, Hiratsuka, all of Japan, assignors to Electroplating Engineers of Japan, Limited, Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 141,094

Claims priority, application Japan, Dec. 29, 1979, 54-172183

Int. Cl.³ B05C *3/02*; B65G *49/04*

U.S. Cl. 118—425 **19 Claims**

1. An apparatus for dipping plating, comprising:

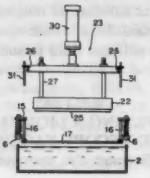
a dipping plating tank;

a pair of spaced, elongated rails supported above said plating tank;

a support carriage including a carrier base supported on said rails for movement therealong and a rack base suspended from and supported on said carrier base for upward and downward movement with respect to said carrier base in directions toward and away from said plating tank, said

rack base having first means for holding the objects to be plated;

pressure means disposed above said plating tank for effecting said movement of said rack base downwardly and upwardly toward and away from said plating tank, said pressure means including a fluid pressure operated piston and cylinder assembly having a downwardly extending piston rod, a pressure frame connected to the lower end of said piston rod, at least one downwardly extending pressure bar secured to said pressure frame and engageable with said rack base as said pressure frame is moved downwardly for pressing said rack base downwardly relative to said carrier base, and at least one suspension bar secured to and extending downwardly from said pressure frame; and



second holding means secured to the lower end of said suspension bar so as to be adjacent said objects to be plated on said rack base when said pressure bar is engaging said rack base for resisting disengagement of said objects from said first holding means on said rack base.

4,351,267

APPARATUS FOR CONTINUOUSLY DEPOSITING A LAYER OF A SOLID MATERIAL ON THE SURFACE OF A SUBSTRATE HEATED TO A HIGH TEMPERATURE

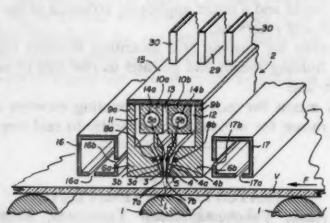
Reinhard Kalbskopf, Onex, and Otto Baumberger, Carouge, both of Switzerland, assignors to Societe Italiana Vetro-Siv-S.p.A., San Salvo, Italy

Division of Ser. No. 117,086, Jan. 31, 1980, Pat. No. 4,294,868. This application Feb. 18, 1981, Ser. No. 236,134

Claims priority, application Switzerland, Feb. 14, 1979, 1412/79

Int. Cl.³ B05B 7/00; C23C 13/10

U.S. Cl. 118—718 **6 Claims**



1. Apparatus for continuously depositing on the surface of a heated substrate a layer of solid material formed from the reaction of at least two reactants selected from gaseous reactants and reactants diluted in inert carrier gas, which apparatus comprises: a source of a first gaseous reactant or reactant diluted in a carrier gas, a source of a second gaseous reactant or reactant diluted in a carrier gas, a nozzle with three jet ducts each having an exhaust aperture constituted by a rectilinear slot and having lateral walls delimiting the longitudinal edges of each slot which walls converge towards a line common to all said jet ducts, a first of said jet ducts adjoining, with a first longitudinal edge of its exhaust aperture, a longitudinal exhaust aperture edge of a second said jet duct and, with the second longitudinal edge of its said aperture, a longitudinal edge of the exhaust aperture of the third jet duct, first and second deflecting surfaces, respectively extending over a predetermined length to each side of said jet ducts from the said second longitudinal edge of the exhaust aperture of the second and third jet duct respectively, said deflecting surfaces being coplanar with each other and with the said longitudinal edges of the exhaust apertures of the jet ducts of the nozzle and being kinematically integral with this nozzle, a first distributor network connecting the source of the first reactant with the first jet duct of the nozzle, a second distributor network connecting the source of the second reactant with the second and third jet ducts of the nozzle, means for effecting relative movement of the substrate and the nozzle in a direction substantially perpendicular to said imaginary common line, means for maintaining constant in the course of said relative movement the distance separating the plane containing said exhaust apertures and said deflecting surfaces from the said surface of the substrate, and maintaining this distance substantially equal to that between the jet ducts of the nozzle and the said imaginary line, and at least one device for evacuating the reaction gases evolving in the space between the said deflecting surfaces and the surface of the substrate, from the extremities of this space most remote from the said apertures of said nozzle.

4,351,268

ROTATABLE FISH CAGE

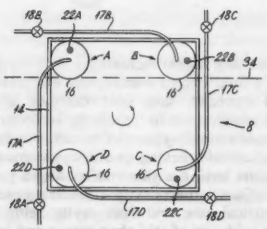
Albert Blair, and Patrick T. Grant, both of Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Filed Feb. 19, 1980, Ser. No. 122,490

Claims priority, application United Kingdom, Feb. 21, 1979, 7906044

Int. Cl.³ A01K 61/00

U.S. Cl. 119—3 **8 Claims**

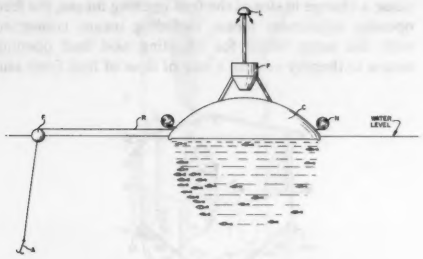


1. A fish cage comprising perforated walls for the flow into or out of the cage of ambient water in which the cage will be located in use, a plurality of water-tight control devices secured relative to said walls with at least one said control device being wholly immersed in said ambient water at any given moment, each said control device including first, inlet and outlet, rotation valves for use in rotating the cage and second, inlet and outlet, buoyancy valves for use in controlling the buoyancy of the cage, said control devices having external walls which are apertured to allow the ingress or egress of ambient water and each device including a water-tight and inflatable core member, the interior volume of each said core member communicating both with said respective rotation valve and said buoyancy valve.

4,351,269
METHOD OF AND APPARATUS FOR UNCONFINED FISH FARMING AND THE LIKE

Robert H. Rines, and Albert H. Knowles, both of 13 Spaulding St., Concord, N.H. 03301

Filed Aug. 27, 1980, Ser. No. 181,832
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 14 Claims

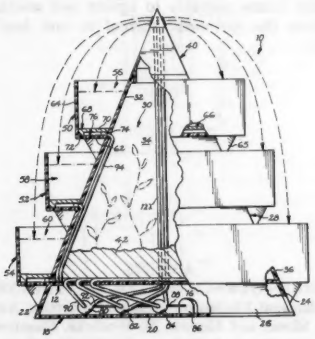


1. In a method of fish farming, the steps including confining fish under a water-contacting light-blocking cover disposed in a body of water, by providing lateral confinement means extending around and downwardly of the cover, moving the cover and confinement means through the water so as to transfer the fish from one location to another, then removing the confinement means and supplying feed to the fish externally of the cover during continued growth of the fish.

4,351,270
TERRARIUM/AQUARIUM

Darrell L. Sabin, 1822 NE. 47th, Portland, Oreg. 97213

Filed Sep. 29, 1980, Ser. No. 192,414
Int. Cl.³ A01K *64/00*
U.S. Cl. 119—5 2 Claims



1. Terrarium/aquarium apparatus comprising in operative condition,

a bottom support,

a light-transmissive shell mounted on said support, forming therewith a substantially moisture-tight enclosure, said shell having a detachable crown,

a plant growth medium contained within said enclosure,

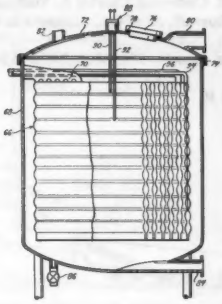
a pair of vertically spaced, light-transmissive jackets mounted on said shell, providing therewith surfaces defining a pair of water-bearing chambers for raising fish, and

for each chamber, water circulating means including a pump, conduit means connecting said pump and the associated chamber, and extending through said medium in heat-exchange relationship therewith, and nozzle means mounted on said shell above the associated chamber for directing water into the same.

4,351,271
REFRIGERATED RECEIVER

Paul Mueller; Daniel C. Manna, and Ray A. Prine, all of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Filed Sep. 4, 1980, Ser. No. 184,128
Int. Cl.³ A01J *9/04*
U.S. Cl. 119—14.09 29 Claims

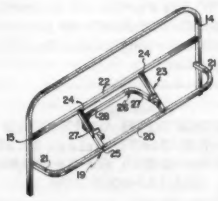


1. A refrigerated receiver for cooling milk and separating it from vacuum in an automatic milking line, said receiver being substantially cylindrically shaped with a heat exchanger disposed therein, said heat exchanger comprising a coiled plate having multiple turns, a warm milk inlet at the top of the receiver and positioned to direct the flow of the milk directly onto the coiled plate, a vacuum outlet, a cool milk outlet at the bottom of the receiver, means to operate the heat exchanger in a heating mode during a cleaning cycle to heat a cleaning fluid as it is circulated through the receiver, and means to agitate the cleaning fluid in said receiver as it is being circulated therethrough.

4,351,272
ANTI-CRUSHING BAR ASSEMBLY FOR PIG FARROWING CRATES

Richard McDonald, General Delivery, Gunton, Manitoba, Canada (R0C 1H0)

Filed Mar. 16, 1981, Ser. No. 244,005
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 6 Claims



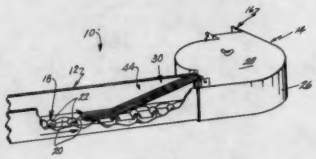
1. In a pig farrowing crate which includes a horizontally situated lower comfort bar extending outwardly from the vertical side frame of the crate and a further horizontal bar thereabove in spaced and parallel relationship with said comfort bar but spaced inwardly therefrom and in the plane of said vertical side frame; an anti-crushing bar assembly, said anti-crushing bar assembly including support means secured to said crate and an inwardly extending anti-crushing bar pivotally secured by the ends thereof to said support means said support

means including a pair of support bars secured to and including upwardly and inwardly between each comfort bar and said further horizontal bar thereabove, said support bars being perpendicular to the comfort bars and said further bars and in spaced and parallel relationship to one another and means cooperating between said support means and said anti-crushing bar normally maintaining said anti-crushing bar substantially horizontally but allowing same to pivot upwardly from the horizontal position.

4,351,273
MOVABLE CHICK GUARD

Eddie L. Holland, Cumming; Charles K. Stallings, Lilburn, and Jack Parker, Roswell, all of Ga., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,914
Int. Cl.³ A01K *39/01*
U.S. Cl. 119—51 R **7 Claims**



1. A guard for a conveyor feeder of the type having a conveying chain movable in a feed trough and into a housing, said guard comprising:

a bracket;

an elongated kicker member having an upturned forward end, a rearwardly extending elongated portion which is angled with respect to said forward portion and a rear end; and

means for movably connecting said kicker member at its rear end to said bracket so that said bracket may be attached to a conveyor corner housing and the kicker member will ride on a feed conveyor to kick small chicks off the feed conveying chain and the kicker member may be moved rearwardly until it lies on the housing to keep more mature chickens from sitting on the housing, said kicker member comprising a plurality of elongated parallel wire members interconnected by a plurality of transversely extending wire members, each of said elongated parallel wire members including an intermediate portion, a rearwardly extending portion intersecting said intermediate portion at an angle "a" greater than 90° and a forward portion intersecting said intermediate portion at an angle "b" less than 90°, and wherein said intermediate portion of each of said elongated parallel wire members has a length l_1 at least equal to the longitudinal dimension of a link of the conveying chain.

4,351,274
LIVESTOCK FEEDER WITH ADJUSTABLE FEED GATE

Steven R. Pannier, P.O. Box 72, McLean, Ill. 61754

Filed Nov. 4, 1980, Ser. No. 203,986
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—53.5 **13 Claims**

1. An animal feed apparatus comprising:

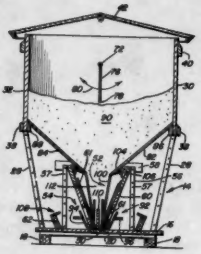
a storage bin for storing animal feed;

a feeding section means having a passage for feed to flow from the bin to at least one animal feeding trough including a snuffle bar with a lip inwardly directed over the at least one animal feeding trough for retaining said animal feed therewithin and the feeding section means including divider means associated with said storage bin to which animal feed stored in said storage bin is directed;

feed opening means associated with said feeding section means feeding section means and said at least one animal feeding trough;

said feeding section means including an inwardly inclined panel spaced from said snuffle bar;

feed opening adjustment means including an adjustable meter board slidably positioned within the passage of the feeding section means and supported by said inclined panel, means for the movement of the meter board to cause a change in size of the feed opening means, the feed opening adjustment means including means connected with the meter board for adjusting said feed opening means to thereby control a rate of flow of feed from said



feeding section means through said feed opening means; and

agitator means having one end thereof positioned within said feeding section means and the other end thereof positioned within said feeding trough and terminating in a livestock nose engaging means, said agitator means being floatingly attached by chain link means at the one end thereof to an upper portion of said inwardly inclined panel of said at least one animal feeding section means and including means effectively biasing the movement of the agitator means operable to agitate said animal feed to facilitate the movement thereof to said feed opening means.

4,351,275
SOLIDS QUENCH BOILER AND PROCESS

Arju H. Bhojwani, Chelmsford; Robert J. Gartside, Auburndale, both of Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Oct. 5, 1979, Ser. No. 82,162
Int. Cl.³ F28C *3/16*; F22D *1/00*
U.S. Cl. 122—7 R **14 Claims**

1. An apparatus for quenching effluent comprising:

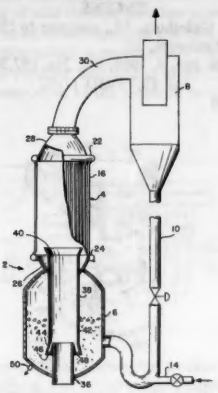
a. a fluidized bed of particulate solids;

b. a reactor effluent outlet tube extending into the fluidized bed;

c. a riser tube having an inside diameter larger than the outside diameter of the reactor outlet tube aligned with the reactor outlet tube, which riser tube surrounds the reactor outer tube and depends into the fluidized bed below the top of the reactor outlet tube;

d. an opening defined by the outside of the reactor outlet tube and the inside of the riser tube which opening pro-

vides communication between the fluidized bed and the interior of the riser tube; and



e. an indirect heat exchanger, wherein the riser tube terminates at the entry of the hot side of the indirect heat exchanger.

4,351,276

HEAT RECOVERY DEVICE FOR BOILERS

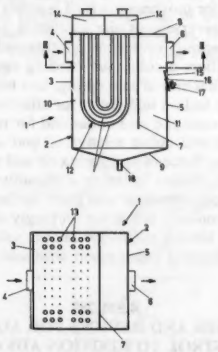
Robert Kremer, Masshofstr. 22, 5090 Leverkusen 3, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,680

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010847

Int. Cl.³ F22B *33/00*

U.S. Cl. 122—20 B **10 Claims**



1. A heat recovery device for boilers, in particular for boilers with a blower-type burner, having a heat exchanger which is located in the stack gas stream and through which is passed a medium which is to be heated up, which comprises a pot-shaped vessel **(2)** which can be inserted in the stack gas duct and is closed on all sides, a stack gas inlet **(4)** leading into the upper zone of the vessel **(2)**, at least one stack gas outlet **(6**, or **30** or **31)** leading out of the upper zone of the vessel **(2)** at a distance from the inlet, a substantially vertical partition wall **(7; 21)** which is located in the vessel **(2)**, extends downwards from the cover **(8)** of the vessel **(2)**, ends at a distance from the bottom **(9)** of the vessel and interrupts the direct stack gas path from the inlet **(4)** to the outlet **(6)** in such a way that a siphon-type stack gas path with an inlet chamber **(10; 26)** and an outlet chamber **(11; 27)** is formed, and a draft-interruption damper **(15; 32)** fitted in the outer vessel wall in the zone of the outlet chamber **(11; 27)**.

4,351,277

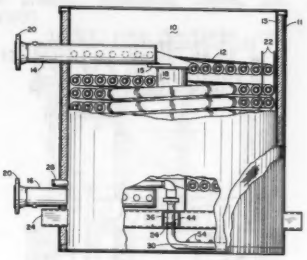
SOOTBLOWER FOR ECONOMIZER

Jerry E. Ryan, and Edward E. Grove, both of Tulsa, Okla., assignors to Tranter, Inc., Tulsa, Okla.

Filed Jan. 23, 1981, Ser. No. 227,812

Int. Cl.³ F22B *37/52*

U.S. Cl. 122—390 **2 Claims**



1. In an economizer of the type having a vertically extending cylindrical casing, a plurality of spirally arranged coils parallel to each other in concentric relation with respect to the central vertical axis of the cylindrical casing, said spiral coils being in the form of finned tubes, the coils being arranged in closely spaced relation but providing clearance between the fins on adjacent coils, means for passing a heat exchange fluid through the spiral coils whereby the coils can extract heat from exhaust gases passing upwardly through the economizer from a boiler; a sootblower mounted in said casing below said spiral coils and including a pair of horizontally disposed structural tubular members arranged across the casing adjacent the bottom thereof, a vertically extending connecting pipe passing through one of said tubular members in concentric relation with respect to said casing and having an upper end and a lower end, a steamline extending horizontally into the interior of said casing below said coils and terminating in an interior ball joint elbow, the steamline having an outer end adapted to be connected to a source of steam, the upper end of the vertical connecting pipe being provided with an enlarged ball opening which is received within the ball joint elbow forming a fluid-tight fit with the ball but allowing a 360° movement of the vertical connecting pipe, a horizontal arm extending outwardly from the lower end of said vertical connecting pipe, a plurality of nozzles on the upper surface of said arm for directing jets of steam into the spaces between adjacent coils, a first sprocket received on said vertical connecting pipe within said one structural tubular member and rotatable with said vertical connecting pipe, a right angle drive having a vertical output shaft and a horizontal input shaft and mounted exterior of said casing on the outer end of said one structural tubular member, a second sprocket in horizontal alignment with said first sprocket and attached to the output shaft of said right angle drive, a first roller chain disposed within said one structural tubular member and passing around said first and second sprockets whereby said first and second sprockets are in driving relation with respect to each other, a third sprocket connected to the input shaft of the right angle drive, and a second chain passing around said third sprocket for permitting remote operation of the right angle drive, whereby, upon actuation of said second chain and upon introduction of steam to said steamline, said arm will rotate beneath said spiral coils and direct jets of steam between said spiral coils to remove soot therefrom.

4,351,278

DRIVE AGGREGATE FOR A HEAT PUMP

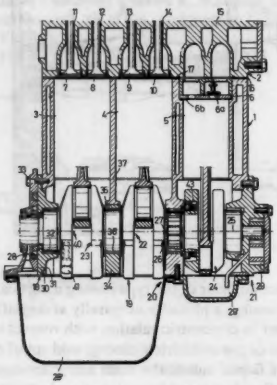
Erich Gaschler, and Cornelia Schwarz, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,536

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908434

Int. Cl.[3] F02B *35/00*

U.S. Cl. 123—195 R 3 Claims



1. In a drive aggregate for a heat pump including a compressor and an internal combustion engine driving the compressor; a common cylinder block including at least one engine cylinder and at least one compressor cylinder; a plurality of bearings mounted in and supported by the cylinder block; a crankshaft supported by the bearings and serving both the engine and the compressor; the crankshaft being formed of an engine-side crankshaft part and a compressor-side crankshaft part; one of the crankshaft parts being a first crankshaft part and the other of the crankshaft parts being a second crankshaft part and having a common longitudinal axis; two of said bearings being first and second end bearings; said second end bearing supporting adjoining end portions of both said first and second crankshaft parts; said first end bearing being situated remote from said second end bearing and supporting said first crankshaft part; said first crankshaft part having a terminal crank arm adjacent said first end bearing; said crankshaft parts being mutually relatively non-rotatably secured to one another at said adjoining end portions; at least one further one of said bearings being an intermediate bearing having an axis and being situated between said first and second end bearings; said intermediate bearing having a split structure formed of first and second bearing parts for a lateral installation on said first crankshaft part; the improvement wherein said terminal crank arm has a removable portion; the improvement further comprising first means for detachably mounting said first and second bearing parts of said intermediate bearing to one another and to said cylinder block at a location of installation to permit said first crankshaft part to be movable to and from said location of installation in a direction substantially transverse to said longitudinal axis of said first crankshaft part; said first and second bearing parts having, in a released state of said first means, a freedom of motion to and from said location of installation in a direction transverse to said axis of said intermediate bearing and second means for detachably securing the removable terminal crank arm portion to said first crankshaft part.

4,351,279

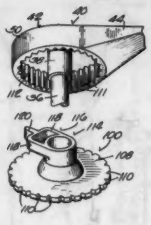
AIR VANE GOVERNOR FOR INTERNAL COMBUSTION ENGINE

Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 9, 1980, Ser. No. 157,305

Int. Cl.[3] F02D *11/02*

U.S. Cl. 123—391 9 Claims



1. An internal combustion engine comprising a carburetor having a throat, a pivotal throttle member disposed in said throat and pivotable between an open position and a fluid flow restricting position, a movable air vane including a body comprising an annular wall extending axially from said body and having an inner surface, a rotatable shaft carrying said throttle member and connected to said air vane for moving said throttle member in response to movement of said air vane, means for impelling air against said air vane to move said air vane and urge said throttle member toward a flow restricting position in response to engine rotation, a torsion spring encircling said shaft, having a first end connected to said shaft for biasing said throttle member toward the open position, and having a second end, and adjustment means connected to said spring for adjusting the biasing force of said spring on said throttle member, said adjustment means including a control member connected to said second end of said spring and mounted remotely from said shaft for movement which is solely reciprocatory in a direction transversely of the rotational axis of said shaft between a first spring force level position and a second spring force level position, a collar surrounding said shaft and connected to said first end of said spring, and interlocking means on said air vane and on said collar for effecting common rotation of said air vane and said collar and for releasably permitting rotation of said collar relative to said air vane so as to adjust the biasing force of said spring on said throttle member, said interlocking means including a plurality of circumferentially spaced indentations on said inner surface of said wall, a detent element on said collar for lockingly engaging said indentations, and biasing means for biasing said detent element into releasable locking engagement with said indentations.

4,351,280

PROCESSES AND DEVICES FOR AUTOMATIC CONTROL TO IGNITION ADVANCE

Gaston Arnaud, Paris, France, assignor to Societe Industrielle de Brevets et d'Etudes SIBE, Neuilly-sur-Seine, France

Filed Apr. 8, 1980, Ser. No. 138,432

Claims priority, application France, Apr. 13, 1979, 79 09528

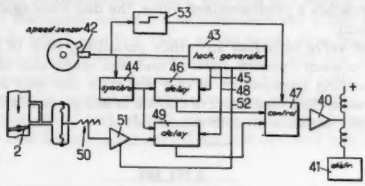
Int. Cl.[3] F02P *5/10*

U.S. Cl. 123—415 1 Claim

1. In a spark ignition engine having an intake pipe an operator operable throttle member in said intake pipe and a turbine-compressor unit whose compressor is located in said intake pipe upstream of said throttle member, a device for automatically adjusting the ignition advance, comprising:

tachometric generator means operatively connected to said engine and constructed to supply an electric synchronization signal for each ignition of the engine and a control signal whose value is an increasing function of the engine speed,

pressure sensing means, having a chamber connected to a point of said intake pipe which passes from upstream to downstream of said throttle member upon opening of the latter from its minimum opening position and to a point of said intake pipe which is continuously located upstream of said throttle member and arranged to deliver an electric signal representative of the pressure in said chamber,



a variable gain amplifier connected to receive said pressure responsive signal and to deliver an output signal amplified in a ratio determined by the value of the control signal from said tachometric generator means,

and programmable delay means connected to receive a delay control signal from said amplifier and said synchronisation signal and to deliver an output signal causing engine ignition.

4,351,281

METHOD AND SYSTEM FOR OPERATION OF A SPARK-IGNITED INTERNAL COMBUSTION ENGINE

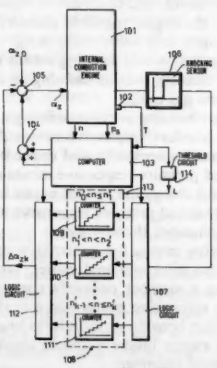
Istvan Geiger; Heinz Theuerkauf, both of Brunswick, and Klaus Stamm, Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 170,766, Jul. 21, 1980. This application Mar. 18, 1981, Ser. No. 244,868

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930540; Mar. 25, 1980, 3011332; Jul. 19, 1980, 3027532

Int. Cl.³ F02P *5/04, 5/14, 11/02;* **F02B** *3/00*

U.S. Cl. 123—425 **16 Claims**



1. In a method for operating a spark ignited internal combustion engine, wherein an engine timing adjustment signal is generated as a function of engine operating conditions, and wherein a timing correction signal is generated for each of a plurality of engine speed ranges in response to engine knocking, said correction signal being combined with said adjustment signal to prevent engine knocking, the improvement wherein said correction signal for a first selected speed range is generated in response to the onset of engine knocking and said correction signals for the remaining speed ranges are derived from said correction signal for said first selected speed range.

4,351,282

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

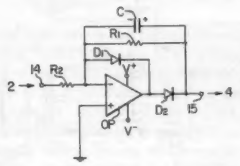
Hiroo Utsumi, Kariya; Yukio Sakakibara, Anjo; Teruyoshi Ito, Kariya; Toshiharu Iwata, Aichi, and Takashi Yamada, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 20, 1981, Ser. No. 284,944

Claims priority, application Japan, Jul. 22, 1980, 55/104342[U]

Int. Cl.³ F02B *3/00;* **F02P** *5/00*

U.S. Cl. 123—425 **4 Claims**



1. In an ignition timing control system for an internal combustion engine including a knocking sensor for detecting knocking elements such as vibrations and noises caused by the knocking of the internal combustion engine, a knocking decision circuit for making a decision on a knocking by comparing an output of said knocking sensor with a knocking decision level, and an ignition timing control circuit for controlling the ignition timing in accordance with the output of said knocking decision circuit, the improvement comprising a knocking decision level generator circuit including:

an operational amplifier with an inverting input thereof supplied with an output of said knocking sensor;

a rectifier element serially connected between the output of said operational amplifier and said knocking decision circuit; and

a feedback circuit including a parallel circuit having a capacitor and a resistor, said feedback circuit being inserted between the output of said rectifier element and the inverting input of said operational amplifier, said parallel circuit having a time constant sufficiently longer than the period corresponding to the knock frequency, whereby the output of said knocking sensor being half-wave rectified, integrated and amplified thereby to apply a DC output of said rectifier element to said knocking decision circuit as said knocking decision level.

4,351,283

DIESEL FUEL INJECTION PUMP SECONDARY FUEL METERING CONTROL SYSTEM

Frank Ament, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

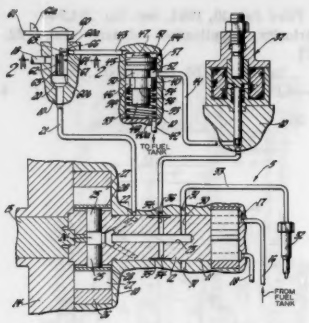
Filed May 1, 1981, Ser. No. 259,589

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—458 **3 Claims**

1. In an engine driven, solenoid valve controlled spill-inject-spill type fuel injection pump having a housing means with an injection pump means therein for sequentially supplying pressurized fuel via discharge passage means to a plurality of injectors, a spill passage means in the housing means in communication at one end with the discharge passage means and having at least one solenoid valve operatively associated therewith for normally controlling the spill-inject-spill flow from the discharge passage means, and a supply pump for supplying fuel via an inlet passage means to the injection pump means, the improvement comprising: a drain passage means connected to

the spill passage means downstream of the solenoid valve, said drain passage means including a cylindeer that is connectable at one end to a reservoir for fuel at low pressure; a control passage interconnecting the inlet passage means intermediate its ends to the opposite end of said cylinder; a metering valve operatively positioned in the inlet passage means whereby to control fuel flow to the injection pump means and to said control passage; a spring biased isolation valve operatively positioned in said cylinder for controlling spill flow through



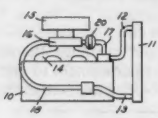
the spill passage means; and an actuator means including an operator actuated accelerator lever means and an electrical actuator operatively connected to said metering valve and being operative when said solenoid valve is functionally operative to move said metering valve to a position permitting full fuel flow to the injection pump means and, when the solenoid valve is functionally inoperative to move said metering valve to positions for metering fuel flow to the injection pump means.

4,351,284

INTERNAL COMBUSTION ENGINE WITH WATER HEATED INTAKE MANIFOLD

George C. Ludwig, Florence, S.C., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Dec. 28, 1979, Ser. No. 108,006
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—545 **3 Claims**



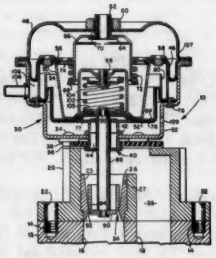
1. An internal combustion engine system comprising
a liquid cooled internal combustion engine including a water heated plenum associated with the intake manifold thereof,
an outlet water line and a return water line extending from said engine to said water cooled manifold,
a temperature controlled normally open plenum valve in one of said lines,
said valve comprising a body having an inlet and an outlet connected to its respective line,
a bi-metallic disc in said body,
a seal associated with said disc,
said disc normally being out of engagement with said seal such that when the coolant is below a predetermined temperature, the coolant flows, and when the coolant reaches a predetermined value, the disc seals against said seal,
said valve including an orifice permitting flow of coolant between opposite sides of said disc when said disc is in sealing engagement in said seal such that said disc will sense the temperature of coolant in said plenum and modulate between predetermined values.

4,351,285

EXHAUST GAS RECYCLING MODULATOR VALVE ASSEMBLY

Cyril E. Bradshaw, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 50,281, Jun. 19, 1979, Pat. No. 4,256,076. This application Sep. 2, 1980, Ser. No. 183,594
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **14 Claims**



1. A valve assemby for controlling the recirculation of exhaust gases in an internal combustion engine in response to the magnitude of the engine manifold pressure and engine exhaust gas backpressure, said valve comprising:
(a) housing means, said housing means including
(i) a lower housing portion defining an exhaust gas inlet and an exhaust gas outlet,
(ii) an upper housing portion defining a cavity;
(b) a first pressure responsive means disposed within said cavity and connected to said upper housing portion;
(c) a second pressure responsive means disposed within said cavity and connected to said upper housing portion, said first and second pressure responsive means defining a first control chamber therebetween;
(d) first valve means for controlling exhaust gas flow between said inlet and said outlet, said first valve means including a member operably connected to said second pressure responsive means and movable therewith;
(e) said upper housing portion including means for communicating engine intake manifold absolute pressure to said first control chamber;
(f) a movable pressure transducer assembly operably connected to said second pressure responsive means, said pressure transducer assemby including
(i) housing shell means,
(ii) a third pressure responsive means defining with said housing shell means an air bleed chamber and a second control chamber,
(g) means for communicating exhaust gas from said inlet to said second control chamber;
(h) said pressure transducer assembly further including sec-

ond valve means having a member operably connected to said third pressure responsive means and movable therewith in response to said exhaust pressure in said second control chamber rising above a predetermined value for permitting a controlled amount of atmospheric air to flow from said first air bleed chamber to said control chamber, thereby increasing the absolute pressure therein; and

(i) wherein, at control chamber pressures between first and second predetermined values, said first and second pressure responsive means are movable between a first position in which said first valve means blocks flow through said inlet and a second position in which said first valve means permits flow through said inlet to said outlet, and wherein at control chamber pressures greater than said second value, said second pressure responsive means is movable between said second position and said first position.

4,351,286

COIL ASSEMBLY FOR AN IGNITION SYSTEM

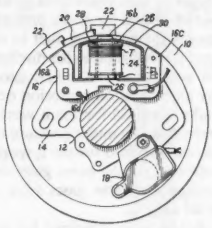
John Aylott, Milton Keynes, England, assignor to WIPAC Development Limited, Buckingham, England

Filed Sep. 22, 1980, Ser. No. 189,407

Claims priority, application United Kingdom, Oct. 4, 1979, 7934440

Int. Cl.³ F02P *3/06;* **F02D** *3/06;* **F02P** *3/08, 1/00*

U.S. Cl. 123—601 **6 Claims**



1. A method of advancing or retarding the spark for an internal combustion engine having a spark plug, a nonmagnetic first member supported for rotation about an axis, and a nonmagnetic second member supported adjacent said first member and fixed against rotation therewith, comprising the steps of:

providing on said first member a pair of angularly spaced magnets of opposite polarity;

providing on said second member a core having at least two legs extending approximately radially of said axis, the free ends of each said leg being located adjacent said first member;

winding a charge coil around a said leg of said core;

winding a trigger coil around a said leg of said core;

electrically connecting a capacitive discharge circuit to said charge coil, said trigger coil and said spark plug;

storing energy from said charge coil in said circuit and, in response to a periodic signal from said trigger coil, periodically discharging said stored energy to said spark plug to periodically produce a spark which is synchronized in time with the rotation of said first member; and

selecting the position of said trigger coil on said associated core leg to provide a desired amount of angular advancement or retardation in the timing of said spark in response to an increase in the speed of said engine, the degree of change in said spark timing for a given increase in engine speed being proportional to the distance of said trigger coil from said first member, said spark timing being advanced when said trigger coil is positioned adjacent said first member and being retarded when said trigger coil is positioned remote from said first said member.

4,351,287

PROCESS OF CONTROLLING THE CURRENT FLOWING PERIOD OF AN IGNITION COIL

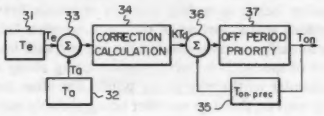
Shinji Shirasaki, Kariya; Takashi Yamada, Anjo, and Mamoru Shimamoto, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 5, 1980, Ser. No. 175,414

Claims priority, application Japan, Aug. 6, 1979, 54/99412

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—609 **5 Claims**



1. A process of controlling the current flowing period of an ignition coil in an ignition system of an internal combustion engine which system includes a rotation sensor for sensing the rotation of the engine, a variables sensor for sensing variables other than the rate of rotation of the engine, a calculation device for calculating the current flowing period from the data supplied from said rotation sensor, said variables sensor and an igniter circuit, an igniter circuit for amplifying the output signal of said calculation device to energize an ignition coil and, when the value of the primary current of said ignition coil becomes a predetermined value, to produce a constant current signal, an ignition coil energized by said igniter circuit and a spark plug, characterized in that said process comprises the steps of:

calculating a command of the constant current period of said ignition coil;

comparing said command with a measured value of the constant current period of said ignition coil for the preceding ignition cycle;

calculating a correction value of the constant current period of said ignition coil for the present ignition cycle;

obtaining a corrected value of the constant current period of said ignition coil for the present ignition cycle, and;

maintaining with priority a predetermined OFF period of the primary current of said ignition coil.

4,351,288

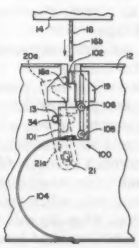
OVEN DOOR LATCH

Joseph L. Gasloli, Kentwood, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 17, 1981, Ser. No. 274,525

Int. Cl.³ E05B *63/20*

U.S. Cl. 126—197 **2 Claims**



1. A mechanism for inhibiting the locking movement of a hooklike oven door latch member engageable with a keeper fixed to an associated oven door, the latch member being movable toward the keeper and lockably engageable with it only when the oven door is closed to a predetermined degree, the inhibiting mechanism comprising:

a stop member movable between two positions; and

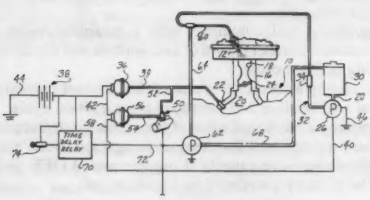
a biasing means for maintaining the stop member at one position, the stop member at said one position blocking and interfering with the movement of the latch member toward the location of the keeper at its closed oven door position, the keeper engaging with the stop member and moving it against the force of said biasing means toward said other position into a non-blocking and non-interfering position relative to the latch member movement when the keeper is at said location, the latch member then being free to move toward and lockably engage the keeper, the stop member being generally linearly movable between said positions and a portion of the latch member being generally linearly movable toward the keeper, said linear movement of the latch member portion being along a line perpendicular to the line along which the stop member linearly moves, the stop member being slidably mounted to a frame means supporting the latch member, the frame means including a slot having a portion extending toward said location of the keeper, said latch member portion including a pin riding in said slot, the stop member at said one end position blocking said slot to retain the pin at the end of said slot portion farthest from said location of the keeper.

4,351,289

WATER INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Vince A. Renda, 6325 Winthrop, Detroit, Mich. 48228

Filed Aug. 6, 1980, Ser. No. 175,608
Int. Cl.³ F02D *19/00*; F02M *25/02*
U.S. Cl. 123—25 A **10 Claims**



1. A water injection system for an internal combustion engine having an air induction system including a carburetor having an intake and an air cleaner mounted upstream of said carburetor comprising:

water reservoir means for storing a quantity of water;

injection nozzle means for directing water into said air induction system and comprising a water spray nozzle mounted in said air cleaner directing water spray towards said carburetor intake;

pumping means controllably activated to pressurize water from said reservoir means;

passage means connecting said pumping means and said nozzle means enabling water flow to said nozzle means only when said pumping means is activated to cause said water spray into said air induction system;

control means responsive to levels of torque demand from said internal combustion engine to enable activation of said pumping means only when torque demand is above a predetermined level, whereby said water injection occurs only above said predetermined torque demand level;

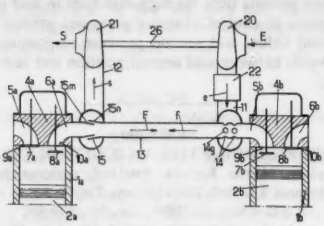
purge means comprising a purge pump connected upstream of said injection nozzle means intermediately of said pump means, said purge pump having an inlet and an outlet, said inlet of said purge pump means connected to said passage means and said outlet of said purge pump connected to said water reservoir means; and means for activating said purge pump means during periods of nonuse of said injection system.

4,351,290

INTERNAL COMBUSTION ENGINE WITH IMPROVED EFFICIENCY AND FILLING BY RECOVERY OF PART OF THE ENERGY OF THE BLASTS WHICH ARE PRODUCED DURING THE OPENING OF THE EXHAUST PORTS

Jean Melchior, 66, Boulevard Maurice Barres, 92200 Neuilly-sur-Seine, France

Filed Nov. 8, 1979, Ser. No. 92,626
Claims priority, application France, Nov. 9, 1978, 78 31730
Int. Cl.³ F02B *33/44*
U.S. Cl. 123—59 BM **9 Claims**



1. In a supercharged internal combustion engine, comprising:

a number n of work chambers, particularly n cylinders, n being an integer at least equal to two, with n intake pipes, for the intake of at least air under pressure into each work chamber, means for providing fuel to each of said work chambers, and n exhaust pipes for discharge of burnt gases outside each work chamber and an associated blast wave produced by a combustion explosion occurring therein,

a common intake manifold for the n work chambers of the engine for admitting air under pressure in said engine, and

a common exhaust manifold for the n work chambers of the engine for discharging the burnt gases outside the engine,

a turbine receiving the burnt gases from said common exhaust manifold and,

a compressor driven by said turbine fed by atmospheric air and delivering air under pressure to said common intake manifold,

the improvement consisting in providing said engine with a number n of transfer conduits,

each conduit connecting directly an associated one of said exhaust pipes to an associated one of said intake pipes, each one of said n exhaust pipes being connected to one of said n intake pipes of a different work chamber, and the volume of each one of said n transfer conduits being at least equal to that of the associated work chambers connected thereto, and including n pairs of passages, each pair of passages putting in permanent communication each of said n transfer conduits with each of said intake and exhaust manifolds such that an exhaust passage of each pair is disposed in vicinity of an associated one of said exhaust pipes and an intake passage of each pair is disposed in vicinity of an associated one of said intake pipes, flow permeability from the intake manifold to the exhaust manifold being successively in series through each of said intake passages, the corresponding transfer conduit and the corresponding exhaust passage allowing in operation the substantially complete discharge towards the exhaust manifold of the burnt gases produced during a preceding cycle in the work chamber associated with said last mentioned exhaust passage and forced into said last mentioned transfer conduit from the exhaust pipe of such associated chamber and the replacement of these gases by at least air under pressure coming from the intake manifold during a period of the engine operating cycle during which said exhaust pipe of such associated chamber and said intake pipe of such associated chamber are each substantially isolated from such associated chamber

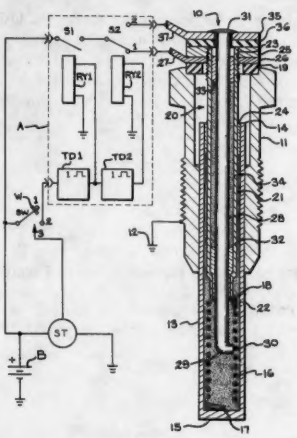
wherein said passages are designed to reduce to a minimum the radiation, towards the intake and exhaust manifolds, of the blast wave which appears during the opening of the exhaust valve of said chamber and follows said transfer conduit, and wherein said respective passages comprise opening means communicating an inside of such associated conduits with an inside of the corresponding manifold through which said associated conduit passes, the opening means of said exhaust passages having a section less than that of the opening means of said intake passages.

4,351,291

GLOW PLUG

Robert A. Mahaney, Graytown, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 2, 1980, Ser. No. 193,377
Int. Cl.³ H05B *3/00*; F23Q *7/00*
U.S. Cl. 123—145 A **2 Claims**



1. A glow plug comprising a shell releasibly engageable with a diesel engine, an electrically conducting heater carried by said shell, said heater having a metallic tubular body with an open end within and electrically connected to said shell and an opposed closed end extending longitudinally from said shell, an open coiled heating filament disposed within said tubular body adjacent said closed end and electrically insulated from said tubular body, said heating filament having a first end electrically connected to said closed end of said tubular body and having a second end, said filament heating to a predetermined design temperature when a predetermined voltage is applied thereto, an insulator carried by said shell, and a terminal assembly carried by said insulator, said terminal assembly having a heater terminal, a heater-connecting means electrically connecting said heater terminal to said second end of said heating filament, a preheat terminal, and preheat-connecting means electrically connecting said preheat terminal to a coil of said heating filament intermediate to said first and second ends.

4,351,292

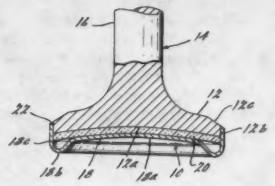
POPPET VALVE SHIELD

Roger P. Worthen, Farmington Hills, and Jay M. Larson, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 3, 1980, Ser. No. 193,679
Int. Cl.³ F01L *3/20*
U.S. Cl. 123—188 AA **6 Claims**

1. An insulated poppet valve of the type including a mushroom head having a circular face portion normally exposed to combusting gases in a combustion chamber of an expansible chamber engine, a sheet metal member spaced from and extending over said face portion,

an annular fold formed continuously around the periphery of said member terminating in a skirt portion welded to the periphery of said head, said face portion, said sheet metal member, annular fold and skirt portion defining an evacuated chamber which provides a heat-conduction barrier for insulating the valve face portion from combusting gases, said annular fold providing an annular expansion joint for relieving stresses in the sheet metal member due to thermal expansion differences between the member and the valve head.

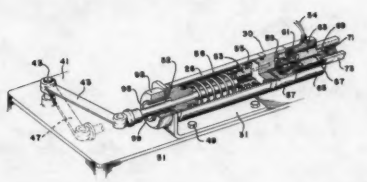


4,351,293

DIESEL VEHICLE SPEED CONTROL SYSTEM

John T. Hewitt, 129 Sheldon St., El Segundo, Calif. 90245

Filed Jun. 4, 1979, Ser. No. 45,140
Int. Cl.³ F02D *1/04*; F02B *77/08*
U.S. Cl. 123—198 DB **14 Claims**



1. In a vehicle having a diesel engine having multiple cylinders and fuel supply means including multiple metering valves and injectors, one set for each of said cylinders, fuel control means mechanically coupled to all said metering valves to control the volume of fuel delivered therefrom to said injectors, the improvement which comprises:

a fluid pressure responsive actuator having a variably positionable actuator arm engageable with said fuel control means to effect movement thereof in a fuel limiting direction, said arm being movable in said fuel limiting direction in response to fluid pressure applied to said actuator, said actuator including bias means for biasing said arm for travel in an opposite, non-fuel limiting direction upon removal of fluid pressure from said actuator;

pneumatic pressure fluid supply means including a source of air under superatmospheric pressure;

conduit means connecting said fluid supply means and said actuator, and including solenoid valve means having an open position for applying said air to said actuator, and a closed position for venting air from said actuator to atmosphere;

a speed sensing element responsive to one of vehicle or engine speed to generate a sensed signal responsive to sensed speed;

system control means to receive said sensed signal, compare said signal to a preset signal level corresponding to a maximum permissible speed, and generate an electrical control signal when said sensed signal deviates from said preset signal level;

means interconnecting said system control means to said valve means to actuate said valve means between said open and closed positions, according to the character of said electrical control signal; and

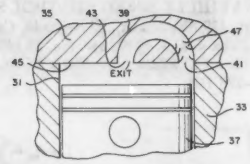
air pressure restrictor means interposed between said pressure fluid supply means and said actuator, in the path of air applied to said actuator, to impede air flow to said actuator to slow extension of said arm in said fuel limiting direction, whereby said fuel is gradually restricted, permitting the speed of said vehicle to react to said reduced fuel flow during travel of said arm in said fuel limiting direction, and said restrictor means being out of the path of air venting to atmosphere from said actuator, whereby said arm is enabled to move relatively rapidly under the bias of said bias means in said non-fuel limiting direction, said restrictor means comprising a porous plug of limited permeability.

4,351,294

FLUIDIC DIODE COMBUSTION CHAMBER

Edward H. Giddings, 1811 Woodrow Ave., Wichita Falls, Tex. 76301

Filed Jul. 17, 1980, Ser. No. 169,773
Int. Cl.³ F22B *17/10*
U.S. Cl. 123—291 **14 Claims**



1. In an internal combustion engine having a cylindrical chamber formed in its block and a piston supported to reciprocate in the cylindrical chamber and wherein the cylindrical chamber has a wall formed by the head of the engine which the face of the piston moves toward and away from during the compression and expansion stroke respectively of the piston, the improvement comprising:

a passageway having an entrance and an exit in fluid communication with the cylindrical chamber,

said passageway being characterized such that during the compression stroke, the flow of working fluid from the cylindrical chamber is predominantly into said entrance of said passageway and during the expansion stroke, the flow of working fluid from said passageway to the cylindrical chamber is predominantly out of said exit of said passageway, and

means for injecting fuel into said passageway for forming a fuel-air mixture for ignition.

4,351,295

FUEL INJECTION METHOD

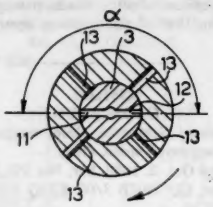
Cesare Bassoli; Giorgio Cornetti, and Francesco Lovisolo, all of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Division of Ser. No. 9,619, Feb. 6, 1979, Pat. No. 4,294,210. This application Jun. 1, 1981, Ser. No. 269,189
Claims priority, application Italy, Feb. 15, 1978, 67315 A/78
Int. Cl.³ F02M *45/02*
U.S. Cl. 123—300 **2 Claims**

1. A method for injecting fuel in the cylinders of a multi-cylinder compression-ignition internal combustion engine for the direct-injection type, said method comprising the steps of

providing a fuel injection pump having a pump body with an internal compression chamber and piston means slidable within the body for compressing fuel in said compression chamber,

connecting, when the engine rotational speed is greater than a threshold value, said compression chamber, during each fuel compression stroke of said piston means, with two different cylinders of the engine so as to deliver to each cylinder of the engine in each cycle thereof a principal injection of fuel, substantially at the end of the compression stroke in said cylinders, preceded by a pre-injection of fuel, and



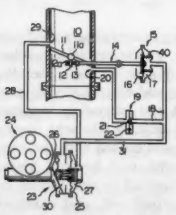
connecting when the engine rotational speed is lower than said threshold value, said compression chamber, during each fuel compression stroke of said piston means, with only one cylinder of the engine, so as to deliver only the said principal injection of fuel to each cylinder of the engine in each cycle thereof.

4,351,296

APPARATUS FOR CONTROLLING DECELERATION OF AN INTERNAL COMBUSTION ENGINE

Nobuaki Kayanuma, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1980, Ser. No. 150,629
Claims priority, application Japan, May 30, 1979, 54-71747[U]
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—328 **3 Claims**



1. An apparatus for controlling deceleration of an internal combustion engine having an intake passage and a throttle valve disposed in said intake passage, said apparatus comprising:

a throttle positioning means for maintaining the opening degree of said throttle valve during deceleration at a predetermined degree larger than the degree of the opening at idling and

a vacuum advance means responsive to a vacuum level in said intake passage downstream from said throttle valve for advancing the ignition timing of said engine, said vacuum advance means operating only when said engine is at a specific operating condition where the degree of the opening of said throttle valve is less than said predetermined degree, and said vacuum advance means being disabled when said throttle positioning means is actuated to keep said throttle valve open at said predetermined degree.

4,351,297

METHOD AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

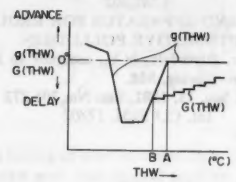
Toshio Suematsu, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 14, 1980, Ser. No. 207,085

Claims priority, application Japan, Nov. 15, 1979, 54/147013

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—421 **8 Claims**



5. Apparatus for controlling the ignition timing of an internal combustion engine, said apparatus comprising:

means for detecting the coolant temperature of the engine and producing an electrical signal indicative of said detected coolant temperature;

means for calculating an ignition timing correction value from said produced temperature signal, by using a function describing a desired relationship between the coolant temperature and the ignition timing correction value, when the detected coolant temperature is lower than or equal to a first predetermined temperature which is lower than a second predetermined temperature of the completely warmed-up engine;

means for gradually reducing the ignition timing correction value to zero, over a predetermined period of time after the detected coolant temperature exceeds said first predetermined temperature, from the value calculated by the above calculating step when the detected coolant temperature is equal to said first predetermined value; and

means for delaying the ignition timing of the engine in accordance with said ignition timing correction value.

4,351,298

INTERNAL COMBUSTION ENGINE AND INTERMEDIATE FLANGE MEMBER FOR SUCH AN ENGINE

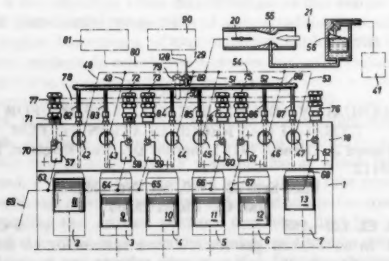
Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 55,074

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831694

Int. Cl.³ F01N *3/10*; F02M *25/06*

U.S. Cl. 123—432 **10 Claims**



1. In an internal combustion engine at least one cylinder, a piston reciprocal within said cylinder, a cylinder head, inlet and exhaust valves located in said cylinder head, a valve seat in said cylinder head for each of said inlet and exhaust valves, one of an ignition and an injection device mounted in said cylinder head, an inlet conduit opening to and extending upstream of said inlet valve, an exhaust conduit opening from and extending downstream of said exhaust valve, a feed line communicating with and located within the inlet conduit upstream of the inlet valve, said feed line having an outlet orifice in said inlet conduit and disposed in the immediate vicinity of said valve seat of said inlet valve at a location which with respect to said valve seat is as remote as possible from the one of said ignition and injection device, control means at the opposite end of said feed line from said outlet connecting said feed line to the atmosphere, and said control means arranged to limit the amount of air drawn in through said feed line to not more than 5% of the swept volume of said cylinder.

4,351,299

FUEL INJECTION SYSTEM

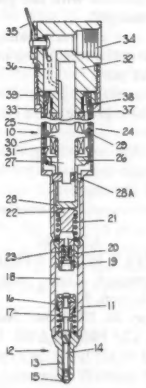
Christopher Costello, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 21, 1980, Ser. No. 141,970

Claims priority, application United Kingdom, Feb. 19, 1980, 8005553

Int. Cl.³ F02D *35/00*; F02P *5/04*; F02D *5/00*; F02M *51/00*

U.S. Cl. 123—472 **4 Claims**



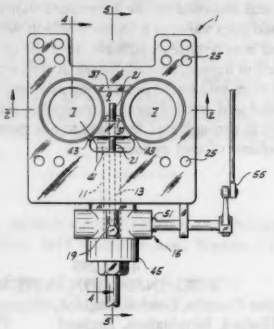
1. A fuel injection system for supplying fuel to an internal combustion engine, the system being of the kind comprising a pumping plunger slidable in a bore, an outlet from one end of the bore, a valve controlled fuel inlet to said one end of the bore, electromagnetic means which is supplied with electric current to cause movement of the plunger towards said one end of the bore, resilient means operable when the supply of electric current is halted to effect movement of the plunger away from said one end of the bore, transducer means for providing a signal indicative of the position of the plunger within the bore, first electronic means operable to effect energisation of said electromagnetic means, second electronic means operable to effect de-energisation of said electromagnetic means, third electronic means for supplying a required fuel signal to said second electronic means, said second electronic means also receiving the signal from said transducer whereby the supply of electric current to the electromagnetic means is cut off after a predetermined movement of the plunger thereby allowing the plunger to return to its initial position under the action of the resilient means.

4,351,300

LP GAS CARBURETOR

Richard H. Selvidge, Box 299 Rte. 9, Poplar Bluff, Mo. 63901, and Dewey Clark, Box 65A Rte. 2, Broseley, Mo. 63932

Filed Feb. 6, 1980, Ser. No. 119,143
Int. Cl.³ F02M *21/02*
U.S. Cl. 123—527 **20 Claims**



1. An LP gas carburetor comprising:

a body adapted to be mounted on an engine, the body having a passage therethrough for flow of an air-fuel mixture through the carburetor, and a main and an auxiliary inlet port in communication with the passage for the flow of LP gas to the passage;

a tube projecting into and terminating within the passage, the axial passage in the tube being in communication with the auxiliary inlet port;

a main valve for controlling the flow of LP gas from a source thereof through the main inlet port to the passage; and

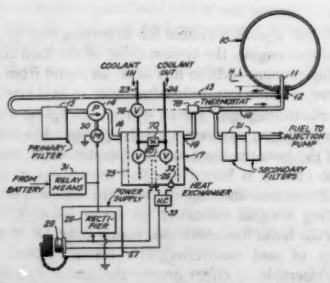
an auxiliary valve for controlling the flow of LP gas from the source through the auxiliary inlet port to the passage for the idling of the engine.

4,351,301

FUEL SUPPLY FOR A DIESEL ENGINE

Walter E. Allen, Prospect, Conn., assignor to Transamerica DeLaval, Inc., Princeton, N.J.

Filed Apr. 30, 1980, Ser. No. 145,347
Int. Cl.³ F02M *31/00, 31/12*
U.S. Cl. 123—557 **18 Claims**



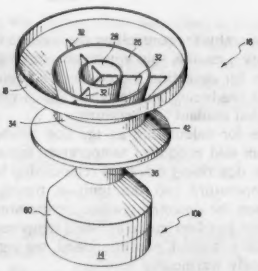
1. A diesel-engine fuel-supply system comprising a fuel tank, an external fuel-circulation line including a circulation pump and having fuel-in and fuel-out connection to said tank, a fuel heater series-connected in said circulation line between said pump and the fuel-in connection to said tank, engine-operated first means for driving said pump and for supplying heat to said heater during periods of engine operation, externally powered second means for driving said pump and for supplying heat to said heater during periods in which the engine is not operating, and an output fuel-supply line connection to said circulation line between said fuel heater and the fuel-in connection to said tank, whereby said output-line connection may deliver heated fuel from said circulation line to the injection system of the engine, not only during periods of engine operation but also when starting the engine after a period of operation of said second means.

4,351,302

METHOD AND APPARATUS FOR REDUCING AUTOMOTIVE POLLUTION

David H. Brettler, Riverdale, N.Y., assignor to Brett Enterprises, Inc., Silver Spring, Md.

Filed Sep. 11, 1981, Ser. No. 301,272
Int. Cl.³ F23L *17/02*
U.S. Cl. 123—566 **3 Claims**



1. A concentrator which comprises:

(a) a plurality of concentric imperforate frustoconical sections of approximately the same height and having substantially the same projected apex,

(b) baffles between and supporting the frustoconical sections,

(c) an inlet end,

(d) an outlet end,

(e) an inversely-tapered immperforate frustoconical section and

(f) an outlet tube,

the concentric frustoconical sections having wider and narrower bases, the wider bases comprising the inlet end and lying substantially in one plane and the narrower bases comprising the outlet end and lying substantially in another plane parallel thereto;

the baffles being spaced from each other and perpendicular to the frustoconical sections they support;

the inversely-tapered section surrounding and being substantially concentric with the outlet tube and having its narrower end at the outlet end; and

the outlet tube having an inlet at or immediately downstream of the projected apex.

4,351,303

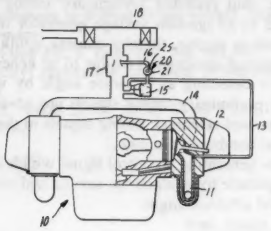
MANUALLY ADJUSTABLE VALVE MEANS FOR AN EXHAUST GAS RECIRCULATION SYSTEM

Raymond J. Tierney, 1911 Longview Dr., New Brighton, Minn. 55112

Filed Sep. 22, 1980, Ser. No. 189,376
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **5 Claims**

1. In an exhaust gas recirculation system for an internal combustion engine, wherein said exhaust gas recirculation system contains a negative pressure line from a carburetor communicating with valve means to control the amount of exhaust gas recycled to an intake manifold in accordance with

the pressure variation in said negative pressure line, the improvement comprising a manually adjustable valve means inserted in said negative pressure line, said manually adjustable



valve means having an inlet port open to the atmosphere and at least one outlet port open to said negative pressure line, and manual adjusting means to control the size of said inlet port.

4,351,304

FUEL INJECTION VALVE

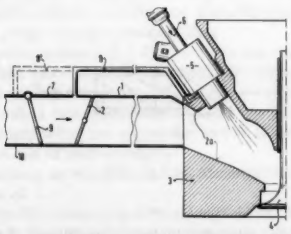
Kurt Schweizer, Ingersheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 248,750

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013086

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—585 **4 Claims**



1. A fuel injection valve wherein preparation of a fuel injected into a intake passage in a cylinder of an internal combustion engine downstream of a throttle device is effected by a gaseous medium, in which said fuel injection valve includes a nozzle valve that injects fuel when the nozzle valve is opened, a mixture guidance conduit relative to said nozzle valve into which fuel is injected, said guidance conduit including a mouth, an intake tube connected with said mixture guidance conduit at a position directly opposite that at which fuel is injected, a throttle valve upstream of said intake tube connection with said mixture guidance conduit and an annular conduit surrounding said mixture guidance conduit, a fluid line connected at one end to said annular conduit, said annular conduit including an end opening through which fluid from said fluid line discharges into said intake passage whereby fluid admitted through said conduit surrounds the injected fuel discharged from said mixture guidance conduit.

4,351,305

FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

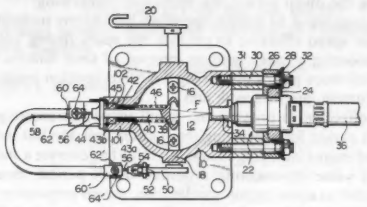
Kiyoshi Isogai, Toyota, and Kazuyoshi Sugaya, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 6, 1980, Ser. No. 157,241

Claims priority, application Japan, Aug. 3, 1979, 54-98610

Int. Cl.³ F02M *29/04*

U.S. Cl. 123—590 **5 Claims**



1. Fuel injection apparatus for a multi-cylinder internal combustion engine which includes a tubular body through which intake air passes and a butterfly throttle valve arranged in the body for controlling the amount of the flow of air passing therethrough, comprising:

fuel injection nozzle means secured to the body upstream of the throttle valve for providing a single flow of fuel into the interior of the body substantially transverse to the axis thereof and to the axis of rotational movement of the valve;

guide means in the body opposed to said nozzle means for intercepting the flow of fuel therefrom and directing said flow with a 90° change of direction toward the valve and parallel to the axis of the body, said guide means being mounted for linear movement transverse of the axis of the body toward and away from said nozzle means; and

drive means connected to said guide member and to the valve and responsive to movements of the latter for moving said guide means so that the air-fuel ratio of the air-fuel mixture passing by the valve on one side of its said axis is substantially equal to the air-fuel ratio of the air-fuel mixture passing by the valve on the other side of its said axis irrespective of the degree of opening of the valve.

4,351,306

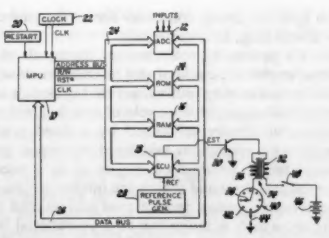
ELECTRONIC IGNITION SYSTEM

James E. Luckman, Anderson; William P. Winstead, Alexandria, and John L. Kastura, Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 26, 1981, Ser. No. 267,269

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—609 **4 Claims**



1. Apparatus for generating dwell and ignition timing values in an electronic spark control system for an internal combus-

tion engine, the electronic spark control system including an ignition coil and being characterized in that ignition dwell and spark timing are provided in response to dwell and ignition timing values and an estimated period between reference pulses provided at a predetermined engine crank shaft angle relative to each top dead-center position and further characterized in that the spark timing error introduced by the error between the actual and estimated period between reference pulses resulting from engine acceleration is minimized by shortening the dwell period, the apparatus comprising:

means responsive to engine operating parameters including engine speed effective to provide the spark timing value representing a spark ignition interval of time relative to the reference pulses producing a desired ignition angle at the current engine speed; and

means effective to provide the dwell value representing a dwell period for energizing the ignition coil, the last mentioned means including means effective to generate a static dwell value representing a desired dwell period, means effective to sense engine acceleration, means responsive to a sensed engine acceleration effective to generate a dynamic dwell value representing at least the time that the dwell period may be shortened to minimize spark timing error, and means effective to sum the static and dynamic dwell values to produce the dwell value, whereby during steady state engine speeds, the dwell period is equal to the static dwell value to minimize power dissipation in the electronic spark control system and is the sum of the static and dynamic dwell values during engine acceleration to ensure that the desired dwell period is provided during engine acceleration where ignition timing error is minimized by shortening the dwell period.

4,351,307

IGNITION TIMING CONTROLLER FOR AN INTERNAL COMBUSTION ENGINE

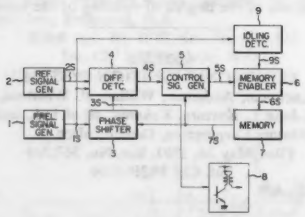
Satoshi Komurasaki, and Atsushi Ueda, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 181,395

Claims priority, application Japan, Aug. 22, 1979, 54-107433

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—618 **4 Claims**



1. An ignition timing controller for an internal combustion engine comprising, in combination:

means for generating reference timing signals at fixed rotational angles in a cycle of said internal combustion engine,

means for generating preliminary timing signals at advanced rotational angles in the cycle of said internal combustion engine which are advanced by a fixed predetermined angle with respect to said fixed rotational angles when said internal combustion engine is in a predetermined operational state and which are further advanced depending on an operating parameter of said internal combustion engine, which is indicative of a operational state of said internal combustion engine, initial value of said fixed predetermined angle being greater in magnitude than a variation of said advanced rotational angles due to accidental causes including aging of a system including said ignition timing controller and said internal combustion engine,

means for retarding said preliminary timing signals by a controlled angle in the cycle of said internal cobustion engine, said retarded preliminary timing signals being applied to an ignition voltage generator of said internal combustion engine, thereby causing ignition voltage for said internal combustion engine to be generated,

means for detecting an advance angle by which said retarded preliminary timing signals are advanced with respect to said reference timing signals in the cycle of said internal combustion engine,

means for generating a control signal which is proportional in magnitude to an algebraic sum of said controlled angle and said advance angle,

memory means, and

means for causing said control signal to be memorized in said memory means when said internal combustion engine is in said predetermined state,

said memory means applying said memorized control signal to said retarding means, thereby controlling said controlled angle so that said advance angle by which said preliminary advanced timing signals are advanced with respect to said reference timing signals become substantially zero, when said internal combustion engine is in said predetermined state.

4,351,308

PHOTOACTIVE IONIZATION HIGH-TENSION PULSATOR OF CARBURETOR MOTOR IGNITION SYSTEM

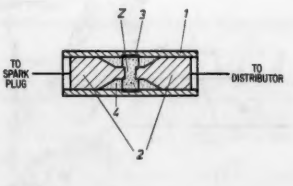
Esref Halilovic, D. Tucovica 141, and Branko Radisic, Lole Ribara 2, both of 11000 Belgrade, Yugoslavia

Filed Dec. 5, 1979, Ser. No. 100,552

Claims priority, application Yugoslavia, Dec. 7, 1978, 2862/78

Int. Cl.³ F02P *15/00*

U.S. Cl. 123—627 **1 Claim**



1. Photoactive ionisation high-tension pulsator of a carburetor motor ignition system having a distributor and a spark plug providing a high voltage, comprising:

a tubular housing having an inner wall,

electrodes disposed in said tubular housing and spaced apart by a gap, there being an inside space between the electrodes and the tubular housing, said inside space being filled with an ionisable gas, and

a ring positioned on the inside wall of the tubular housing, said ring being positioned within the inside space filled with the ionisable gas and being separated from the electrodes;

wherein said pulsator is connected to and between said distributor and said spark plug, said high voltage resulting in breakdown across said electrodes, and said ring comprising a photoactive material in surrounding relationship to the gap and responsive to said breakdown for causing ionisation of said gas, whereby to provide high-frequency current in said motor ignition system.

4,351,309

SAFETY GAP FOR AN IGNITION SYSTEM IN AN INTERNAL COMBUSTION ENGINE

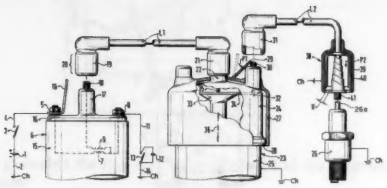
Richard Schleupen, Ingersheim; Reinhold Kaufmann, Oberriexingen, and Dieter Raff, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,557

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930771

Int. Cl.³ B60R *25/04;* F02B *77/00;* F02P *1/00*

U.S. Cl. 123—630 9 Claims



1. Ignition system having

an ignition coil (6) having a housing (15);

a terminal (5) on the housing;

circuit means (1, 3, 4) connecting said terminal to a ground, chassis or reference potential (Ch);

and a coil high voltage terminal (10) on the housing, insulated with respect thereto;

at least one spark plug (26) having a shell connectible to the ground, chassis or reference potential (Ch) and a spark plug high voltage terminal (26*a*);

connection means (L1, L2) removably connectible and electrically interconnecting the coil high voltage terminal (10) and a spark plug high voltage (26*a*);

and a safety means to prevent occurrence of excessive high voltages when the connection means is removed from at least one of said terminals

comprising, in accordance with the invention the combination of

electrically conducting terminal means (18, 29, 40) connectible to the ground, chassis or reference potential (Ch) and positioned adjacent at least one of the high voltage terminals (10, 26*a*), and forming a ground connection therefore which is effective at the voltage difference between the respective high voltage terminal and the electrically conductive terminal means of substantially less than spark plug sparking voltage

with

insulator means (19, 20; 31; 39) on said connection means which is positioned, upon connection of the connection means to the respective high voltage terminal for interposition between the electrically conductive terminal means in the respective high voltage terminals, to place a zone of insulating material between said terminal means and the respective high voltage terminal, and thus increase the voltage difference required between the respective high voltage terminal and said terminal means for spark breakdown to a value substantially above that of the spark plug sparking voltage.

4,351,310

IGNITION COIL WITH OVERVOLTAGE PROTECTION CONNECTED TO THE SECONDARY WINDING OF THE IGNITION COIL

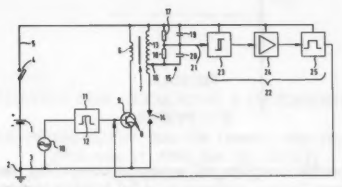
Karl-Heinz Adler, Leonberg; Georg Pfaff, Asperg; Reinhard Leussink, Bremen; Gerhard Söhner, Remshalden; Gerd Höhne, Ludwigsburg; Thomas Jökh, Korntal-Münchingen, and Heinz Decker, Vaihingen Enz-Riet, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 193,186

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940070

Int. Cl.³ F02P *11/00, 1/00*

U.S. Cl. 123—644 10 Claims



1. In an ignition system having an ignition coil (7) having a primary winding (6) and a secondary winding (13), and means (9) for interrupting the current through said primary winding at an ignition time, the improvement comprising

an overvoltage protection circuit (15) directly, galvanically connected to the secondary winding (13) of the ignition coil (7);

and wherein said overvoltage protection circuit has an input circuit (17–20) solely connected directly in parallel across at least a part of said secondary winding.

4,351,311

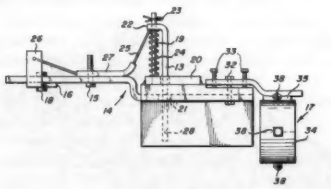
PULLED BOW ARROW HOLDER

Gary L. Phares, 118 Chestnut St., Elkins, W. Va. 26241

Filed Jul. 16, 1981, Ser. No. 283,935

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—41 A 9 Claims

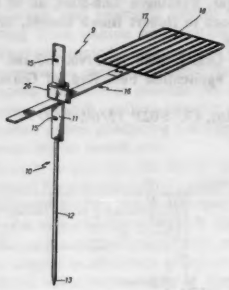


1. Apparatus for holding an arrow in a pulled bow and which releases an arrow when a bow is pulled slightly beyond the position in which an arrow is held, comprising a support adapted to be attached to a bow where the same is gripped by an archer, an arrow-holding bar having an arrow point-receiving indentation, said bar being movably mounted on said support to extend from an arrow-holding position in front of the point of an arrow in a pulled bow to a second position out of the path of an in place arrow, trigger means carried by said support immediately forward of a bow to move said bar into the path of an arrow so that the point of an arrow can be placed in said indentation to hold an arrow until it is pulled, and means biasing said bar out of the path of an arrow so that said bar will be removed from the path of an arrow when the point of an arrow is pulled out of said indentation.

4,351,312
PORTABLE CAMPFIRE GRILL ASSEMBLY

James R. Ivy, 9001 Glacier, #138, Texas City, Tex. 77590

Filed Feb. 2, 1981, Ser. No. 230,544
Int. Cl.³ F24B 3/00; A47G 29/00; F16B 00/00
U.S. Cl. 126—30 4 Claims

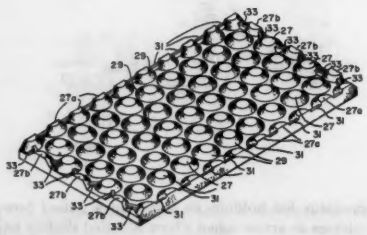


1. A portable campfire grill apparatus comprising: an elongated support having a substantially flat bracket section at its upper end, said bracket section having at least one slot formed in the side thereof; a handle adapted to be attached to a grill, said handle being substantially flat and having an upstanding bight formed intermediate its ends, said bight having a slot formed in the upper wall thereof that is arranged to interfit with the slot in said bracket section; and lock means adapted to be slipped over the top of said bracket section and fitted around said bight to secure said handle to said bracket section.

4,351,313
BARBECUE GRILL SLAB WITH MOLD AS SHIPPING CONTAINER

Eugene F. Kern, 12115 Lake Meade Ct., Creve Coeur, Mo. 63141

Division of Ser. No. 30,532, Apr. 16, 1979, Pat. No. 4,276,869. This application May 1, 1980, Ser. No. 137,907
The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.
Int. Cl.³ F24C 3/00
U.S. Cl. 126—39 J 5 Claims

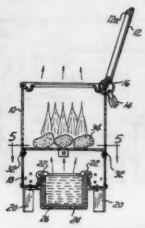


1. A transportable article comprising a mold for a refractory slab for positioning in a barbecue grill between the burner unit and the food-supporting grate having first molding means for defining fluid retaining means for containing grease and rendered meat juices on the slab and preventing such fluids from dripping off the slab, said first molding means including second means for molding a plurality of uniformly spaced bosses simulating coals projecting upwardly from the slab top surface, and third molding means for molding integral dam means connecting adjacent bosses nearest the periphery of the slab to form an upstanding continuous peripheral parapet around the slab periphery to contain grease and rendered meat juices on top of the slab and prevent such fluids from dripping off the sides of the slab, said mold being hollow and having a body of unfired refractory material filling said mold and conforming closely to the interior surface thereof forming said slab and said fluid retaining means whereby said mold protects said refractory material body during transportation, said refractory material body being removable from said mold after transportation to permit firing of said refractory material body in service.

4,351,314
PORTABLE HEATER

David C. Morton, 3152 Curtis Dr., Flint, Mich. 48507

Filed Mar. 16, 1981, Ser. No. 244,274
Int. Cl.³ F24C 1/16
U.S. Cl. 126—59 6 Claims



1. A portable heater operable in relatively high and relatively low heat output conditions comprising:
- a cylindrical body portion;
- a grate for dividing said body portion into an upper and a lower portion;
- said upper portion adapted to receive and hold solid fuel on the upper surface of said grate;
- said lower portion having an opening in its base and operable to receive and hold in resilient gripping relationship a receptacle for semi-solid fuel;
- a plurality of openings provided around the lower periphery of said lower portion of said heater; and
- a lid pivotally mounted at the upper end of said body portion for movement between a raised heating position and a lowered snuffing position of the heater.

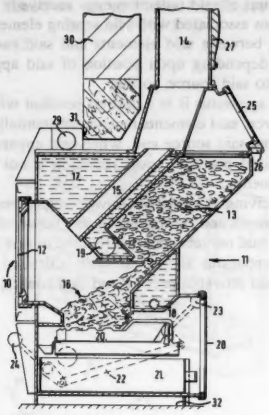
4,351,315
BOILERS

Thomas A. Babbage, Walton-on-Thames, England, assignor to Trianco Redfyre Limited, Sheffield, England

Filed Sep. 29, 1980, Ser. No. 192,334
Claims priority, application United Kingdom, Sep. 27, 1979, 7933548
Int. Cl.³ F24B 3/04
U.S. Cl. 126—73 9 Claims

1. A solid fuel domestic appliance comprising a framework having a front portion and a rear portion and adapted for fixing in an aperture of a partition wall so that simultaneous access to said front and rear portions is prevented, means defining a combustion chamber in the front portion, a flue outlet for communication with a chimney and a fuel hopper mounted in said rear portion so as to be accessible only from behind said partition wall, means supporting a firebed beneath said fuel hopper at the base of the combustion chamber, a discharge throat of restricted size at the base of said fuel hopper so that fuel flows forwardly and downwardly from said hopper to said firebed to maintain a natural angle of repose therein, a transparent facia mounted in the front portion of the appliance to display the burning firebed, and a relatively narrow flue-way

leading from said combustion chamber obliquely rearwards and upwards to said flue outlet, and an access door in the flue



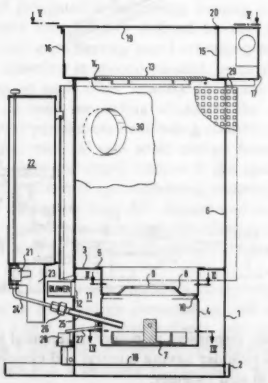
outlet to enable the flue-way to be cleaned and the chimney to be swept.

4,351,316

COMBUSTION APPARATUS FOR BURNING WASTE OILS

Walter Kroll, 42 Burgstaller Strasse, 7141 Kirchberg, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,860
Int. Cl.³ F24C *5/00*
U.S. Cl. 126—93 **28 Claims**



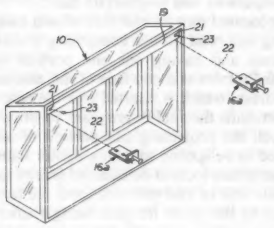
1. Combustion apparatus for burning waste oils, comprising: a primary combustion chamber; a secondary combustion chamber located above said primary combustion chamber; an outer housing; said primary combustion chamber having a sidewall, a top edge and a base and being located in said outer housing to define therebetween a plenum chamber; wall means sealing said plenum chamber relative to said secondary combustion chamber; an air blower mounted outside said plenum chamber and capable of maintaining said plenum chamber at an elevated pressure; air inlet openings in said sidewall for admitting air from said plenum chamber to said primary combustion chamber; a burner bowl contained in said primary combustion chamber adjacent the base thereof; a burner ring; means positioning said burner ring above said burner bowl and below said top edge; an oil supply tank, an oil supply duct leading from said tank to said burner bowl, a motor driven positive displacement pump in said oil supply duct for metering the flow of oil to said burner bowl, and an oil overflow protection device for draining excess oil from the primary combustion chamber; said burner ring having a substantially central aperture and at least an outer ring of orifices and an inner ring of orifices substantially concentrically arranged relative thereto, the orifices of said inner ring being of smaller area than the orifices of said outer ring, and said air inlet openings comprise a first set of air inlet orifices arranged below said burner ring for supplying combustion air to the burner bowl and beneath said burner ring, and a second set of air inlet orifices disposed above said burner ring adjacent said top edge.

4,351,317

APPARATUS FOR ATTACHING A FIRESCREEN TO A FIREPLACE

Ralph E. Matthews, P.O. Box 428, Decatur, Ala. 35602

Filed Aug. 11, 1980, Ser. No. 177,179
Int. Cl.³ F24C *15/12*
U.S. Cl. 126—139 **10 Claims**



1. In a firescreen assembly disposed to surround the front side of the front wall of a fireplace adjacent the opening therein and having a transverse member adapted to span the front side of the front wall of the fireplace above the opening for the fireplace, the improvement which comprises:

(a) at least one generally L-shaped bracket having a vertical leg adapted to extend upwardly in rearwardly spaced relation to said front side of said front wall and a forwardly extending horizontal leg,

(b) there being at least one opening in said horizontal leg,

(c) there being an opening through said transverse member above the opening for the fireplace,

(d) a cable-like member having one end thereof extending through said opening in said transverse member with the other end thereof passing through said opening in said horizontal leg,

(e) means carried by said one end of said cable-like member limiting movement of said one end relative to said transverse member,

(f) means detachably connecting said other end of said cable-like member to said vertical leg of said bracket,

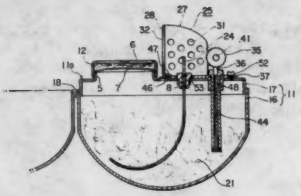
(g) an abutment carried by said fireplace intermediate said vertical leg and said front side of said front wall of the fireplace, and

(h) an actuator member adjustably connected to said vertical leg and adapted to engage said abutment and move said bracket rearwardly away from said transverse member to thereby apply tension to said cable-like member and urge said transverse member both rearwardly and downwardly to secure said firescreen to said fireplace.

4,351,318
POCKET BODY WARMER WITH A CIGARETTE LIGHTER

Shin Ojima, Yao, and Yoshiaki Neriki, Nara, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jun. 9, 1980, Ser. No. 158,027
Int. Cl.[3] A61F 7/08; F23Q 1/02; F23D 3/18, 3/40
U.S. Cl. 126—208 5 Claims



1. A pocket body warmer with an integrated cigarette lighter, comprising:

a case for containing a liquid fuel;

a fuel impregnant housed in the case for soaking up the liquid fuel poured into the case;

a heating unit mounted on one end face of the case, said heating unit covering an opening formed in said end face and having housed therein a platinized catalyst for burning evaporated fuel to generate heat;

a burner located on said end face of said case adjacent said heating unit, said burner comprising a wick mounted on said case and having one end portion which projects outwardly from said end face of the case and an opposite end portion which is inserted into the case to extend into contact with the fuel impregnant to draw up therefrom the fuel, the projecting end portion of said wick being adapted to be ignited to emit a lighter flame;

a firing structure located on said end face of said case, on the opposite side of said end face from the heating unit with respect to the wick, for generating sparks to ignite said wick;

a substantially tubular windshield located on said end face of the case in surrounding relation to said wick, said windshield having a plurality of small air holes therein, said windshield also defining a first opening having a size larger than that of any of said air holes and located on the side of said windshield facing said heater unit for selectively directing the lighter flame produced by said burner toward said heating unit when said case is turned through an angle such that said heating unit is located above said windshield, and said windshield also defining a second opening on the side of said windshield opposite to said first opening and facing said firing structure for directing the sparks from the firing structure to the wick; and

a lid for removably covering the heating unit, the burner, the firing structure and the windshield;

said firing structure and windshield being integrated with one another in a unitary assembly which is attached as a unit to said end face of said case, said unitary assembly being adapted to be detached as a unit from said end face of said case and removed from the vicinity of said wick with said wick remaining mounted on said case.

4,351,319
RADIANT ENERGY TRACKER

Roland W. Robbins, Jr., 1020 Cheryl Ct., Ridgecrest, Calif. 93555

Filed Aug. 17, 1979, Ser. No. 67,283
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—425 3 Claims

1. Apparatus for tracking relative movement between a source of radiant energy and a distant object comprising:

a relatively fixed portion;

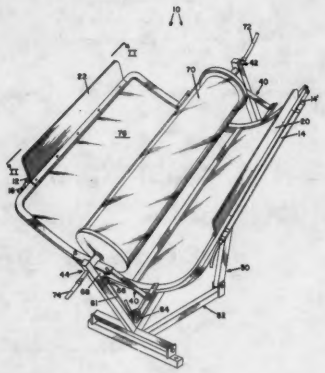
a relatively movable portion;

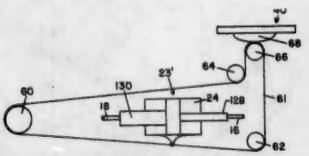
at least two spaced apart radiant energy sensing elements on said movable portion capable of power output relative to the amount of said radiant energy received;

baffle means associated with said sensing elements for interposition between said elements and said radiant energy source, depending upon position of said apparatus with respect to said source; so that

when said apparatus is in a desired position with respect to said source, said elements receive substantially equal radiation from said source and, when said apparatus is not in said desired position, equal radiation is not received by said elements;

means receiving the relative power output respectively of said elements and responsive to any power differential to position said movable portion relative to said fixed portion of said apparatus and to maintain a desired position between said movable portion and said source;





said means responsive to power differential including;

a hollow cylinder having integral end closures;

a piston in said cylinder;

first and second piston rods each attached by an inner end to a respective side of said piston and passing through said end closures;

said cylinder being connected on each side of said piston for fluid communication with one or the other of said sensing elements;

said piston rods being integrally fastened to one portion of said apparatus and said cylinder being mechanically linked to the other said portion; and

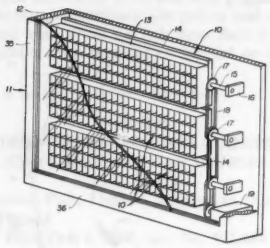
said piston rods being of different diameters to provide a means effective to move said relatively movable portion to a predetermined position with respect to said relatively fixed portion when radiation from said source is completely shaded from said elements.

4,351,320

SOLAR ENERGY HEATING PANEL FOR A BUILDING

Jack E. Tetirick, 105 Indian Springs Dr., Columbus, Ohio 43214

Filed Nov. 13, 1979, Ser. No. 93,411
Int. Cl.³ F24J 3/02
U.S. Cl. 126—425 18 Claims



1. A solar energy heating unit comprising

a supporting structure adapted for positioning in a building wall and defining a generally vertically extending chamber for channeling air vertically therethrough, said supporting structure including a front panel and a rear panel of predetermined horizontal and vertical extent spaced a predetermined distance apart and a vertically extending end panel at each side thereof and interconnecting with said front and rear panels, said front panel having a predetermined area thereof formed from a solar radiation transmitting material,

a plurality of elongated solar energy heating panels positioned within the chamber defined by said supporting structure with each heating panel extending horizontally across the chamber in spaced parallel, vertically stacked relationship to each other heating panel and pivotably mounted on said supporting structure for revolution thereof about parallel axes extending transversely across the chamber, each of said solar energy heating panels being of a width and depth relative to the spacing of the front and rear panels of said supporting structure to permit revolution through at least 180 degrees and including

(A) an elongated heat-transfer controlling panel having first and second surfaces at opposite respective sides thereof, and

(B) a cellular unit for absorption and conversion of solar radiation to heat energy mounted on said controlling panel at a first one of said surfaces, said cellular unit including a plurality of relatively spaced apart longitudinal walls and a plurality of relatively spaced apart transverse walls each secured to said controlling panel in upstanding relationship to said first surface thereof, said longitudinal and transverse walls disposed in angularly oriented relationship to each other and cooperatively defining a plurality of cells which are open at an end remote to said controlling panel to permit entrance of solar radiation into incident relationship to interior surfaces thereof, each of said longitudinal walls having a plurality of apertures formed therein to permit airflow transversely through each cell,

and

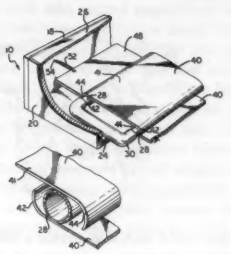
selectively operable pivot means cooperatively interengageable with each of said solar energy heating panels for revolving of said heating panels about their respective transverse axes to a selected position.

4,351,321

SOLAR COLLECTOR PANEL

Ben E. Johnson, 1321 S. Main, Carthage, Mo. 64836

Filed Nov. 3, 1980, Ser. No. 203,115
Int. Cl.³ F24J 3/02
U.S. Cl. 126—446 9 Claims



1. In a solar collector unit having a frame assembly for supporting at least three spaced and generally parallel solar collector pipes used in conveying a solar heat absorbent fluid therethrough, the improvement comprising:

(a) a heat absorbent panel positioned in a heat transfer relationship between each associated pair of adjacent pipes of said collector pipes and forming a panel array; each of said panels being non-integral with said pipes and with each of the other panels;

(b) a pair of hook members on each panel; each hook member contacting in a heat transfer relationship a portion of a respective pipe of said associated pair of pipes; adjacent hook members of adjacent panels cooperating with each other to wrap around opposite sides of a common one of said associated pair of pipes in clamping relationship; said panels including first and second end panels respectively positioned on opposite sides of said panel array; and

(c) spring tensioning means having a biasing position connecting between said first and second of said end panels and said frame and producing forces along said panels generally perpendicular to said pipes so as to provide a clenching interface between said cooperating hook members of adjacent panels and said common collector pipe, whereby said solar collector pipes are urged into a suspended relationship relative to said frame; said biasing means being selectively removable from said spring tensioning position such that the hook members of adjacent panels are not held in clenching interface with each other and each of said panels is easily disengaged from the remaining panels and from said pipes.

4,351,322

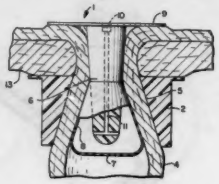
STOMA CONTROL DEVICE AND METHOD

Elliot D. Prager, 1685 E. Valley Rd., Santa Barbara, Calif. 93108

Filed Oct. 10, 1980, Ser. No. 195,944
Int. Cl.³ A61M 19/00
U.S. Cl. 128—1 R 23 Claims

1. A stoma control device comprising, in combination, support means for surgical implantation in the body beneath the abdominal wall and at least substantially around the emerging bowel of a stoma, said support means being adapted to be fastened securely to the abdominal wall and to extend a predetermined distance along said bowel, and said support means including an at least substantially continuous inner wall means having an inner surface which is positioned adjacent said bowel on implantation and which is tapered outwardly along at least most of the length of said support means, and said support means having an end surface for positioning adjacent the abdominal wall, and plug means adapted to be received in said stoma and within said bowel, said plug means including

outwardly directed flange means adjacent one end for cooperation with the outer surface of the body about the stoma and expandable means adjacent the other end, said expandable means, on expansion, presenting an outer surface which is outwardly tapered with a shape which complements the outwardly tapered inner surface of said support means over at least most of the length of said support means whereby during



control of the stoma with said device a relatively large surface of the bowel may be gently compressed between the respective tapered surfaces of the plug means and the support means so as to minimize pressure and tissue destruction and to produce a wedging action of the plug means within the bowel and support means to close the stoma and to prevent expulsion of the plug means from pressure within the bowel.

4,351,323

CURVABLE PIPE ASSEMBLY IN ENDOSCOPE

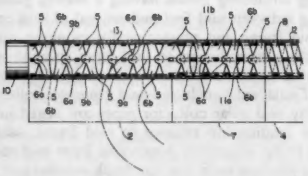
Teruo Ouchi, Kami-Fukuoka, and Hirohisa Ueda, Tokyo, both of Japan, assignors to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 195,735

Claims priority, application Japan, Oct. 20, 1979, 54/145299[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **3 Claims**



1. A curvable pipe assembly for an endoscope comprising:

a first curvable section having a top end adapted to be coupled to a tip end part of said endoscope;

a second curvable section arranged in succession with said first curvable section and having a free end;

each of said first and second curvable sections comprising a plurality of articulation rings juxtaposed by pivotally supporting adjacent articulation rings at points so that said first and second curvable sections are bendable in four directions,

the free end of said second curvable section being adapted to be connected to a flexible tube of said endoscope;

two pairs of stay coils located in said second curvable section and having ends fastened to the connecting point of said first and second curvable sections;

two pairs of pull strings disposed in said two pairs of stay coils, said pull strings having first ends fastened to the top end of said first curvable section and said pull strings adapted to extend through said flexible tube to a manual operation unit of said endoscope, movement of said pull strings effecting movement of said first curvable section in said four directions;

said stay coils preventing said movement of said pull strings from moving said second curvable section in any of said four directions.

4,351,324

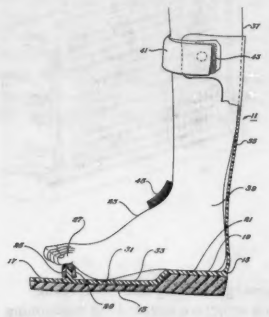
THERAPEUTIC WALKING DEVICE

Arie J. Bronkhorst, Abilene, Tex., assignor to David L. Buhrmann, Abilene, Tex.

Filed Mar. 12, 1981, Ser. No. 243,182

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 J **3 Claims**



1. A therapeutic walking device, comprising:

a platform having a lower surface that is generally flat;

the platform having an upper surface that includes a toe section having the shape of a berm protruding upwardly from the platform near the forward end of the platform and extending transversely across the platform for supporting the toes of the user;

the platform having a heel section protruding upwardly from the platform at the rearward end for supporting the heel of the user, the forward end of the heel section being spaced from the rearward end of the toe section, defining a recessed section between the toe section and heel section for reducing pressure on the user's sole between the toes and heel while standing;

a channel shaped leg section extending upwardly from the rearward end of the heel section for positioning against the rearward side of the calf of the user; and

securing means for removably securing the device to the foot and calf of the user.

4,351,325

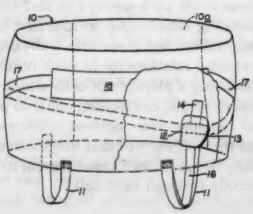
HERNIA SUPPORT

Trevor E. Walker, Con Amore, St. Georges Rd., Donnington, Shropshire, England

Filed Jan. 5, 1981, Ser. No. 222,551

Int. Cl.³ A61F *5/24*

U.S. Cl. 128—96 **7 Claims**



1. A herina support including a belt for securely encircling the wearer's body including an area comprising and substan-

tially surrounding the hernia in use, a pad within the belt having an inner face shaped to bear evenly on the whole of said area and having a strap extending from a lower edge portion of the pad to pass between the wearer's legs in use and secured to the belt in the region of the wearer's back, and a substantially rigid stay member located between the pad and the belt inner face with a first flexible connection between its upper edge and a transverse upper region of the outer face of the pad and a second flexible connection between its lower edge and the belt inner face, whereby movement tending to displace the belt upwards and/or outwardly from said area is accompanied by angling of the stay in reaction to the pull of said strap thereby urging the pad away from the belt inner face to maintain or increase operative even pressure of the pad on the whole of said area.

4,351,326

COPPER WIRE FOR INTRAUTERINA CONTRACEPTIVE DEVICES AND A METHOD FOR MANUFACTURING THE SAME

Ahti A. Kosonen, Pori, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Oct. 3, 1980, Ser. No. 193,484

Claims priority, application Finland, Apr. 2, 1980, 801073

Int. Cl.³ B22F *3/00*; A61F *5/46*

U.S. Cl. 128—130 **1 Claim**

1. A method for preventing conception comprising placing in the uterus an intrauterine contraceptive device having a wire form a corrosion-resistant core wire of some ductile metal nobler than copper and a coating of copper fixed onto the core wire by means of a thin diffusion layer.

4,351,327

DEVICE FOR CONNECTION TO A RESPIRATORY GAS LINE

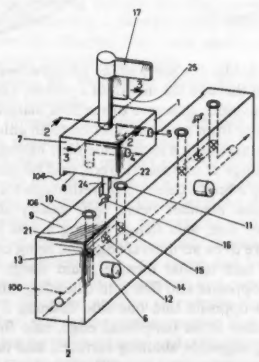
Gerhart Rinne, Stockelsdorf, and Ulrich Heim, Reinfeld, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,538

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3007755

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.14 **14 Claims**



1. A device for connection to a respiratory gas line comprising:

a terminal board having a first engagement surface thereon and a respiratory gas line defined therein with a first pair of connecting lines extending from the respiratory gas line to the first engagement surface and a recess opening;

an equipment unit connectable to the respiratory gas line for receiving gas therefrom, treating the gas received and returning treated gas to the respiratory gas line, said unit having an adapter with a second engagement surface and a second pair of connecting lines extending to the second engagement surface for receiving and returning gas to and from said unit;

alignment means on said adapter and terminal board for aligning said first pair of connecting lines with said second pair of connecting lines when said first engagement surface is engaged with said second engagement surface;

a valve element movable in said terminal board from an "on" position for establishing flow in said first pair of connecting lines between said respirator gas line and said first engagement surface, and to an "off" position for establishing communication between said first pair of connecting lines and blocking communication of said first pair of connecting lines to said first engagement surface; and

a control lever movably mounted in said adapter extendible through said recess opening into engagement with said valve element when said first and second engagement surfaces are engaged with each other to move said valve element.

4,351,328

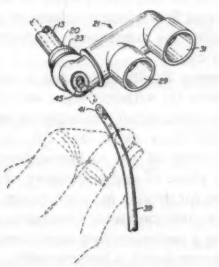
SIMULTANEOUS RESPIRATION AND ENDOTRACHEAL SUCTIONING OF A CRITICALLY ILL PATIENT

Balazs, I. Bodai, Sacramento, Calif., assignor to Sontek Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 134,528, Mar. 27, 1980, abandoned. This application Nov. 7, 1980, Ser. No. 204,841

Int. Cl.³ A61H *31/00*; A61M *25/00*

U.S. Cl. 128—202.16 **24 Claims**



1. A ventilator system, comprising:

a conduit adapted to be connected between a trachea tube and a respirator and having an opening in a side wall of said conduit near the trachea tube,

a length of bendable suction tubing having a valve located a distance from a free end of the tube, said valve being actuatable between positions opened and closed to fluid flow therethrough, and

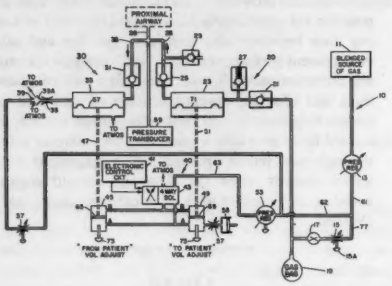
means installed in said opening for receiving said free end of the suction tube therethrough for passage through said conduit into the trachea tube, said receiving means being characterized by substantially sealing said opening in the absence of the suction tube being positioned therein, by permitting insertion of the tube therethrough by pushing along its length in a manner to form a substantial seal between the tube and conduit without any further manipulation, and by permitting withdrawl of the suctioning tube therefrom by hand with a resulting substantial resealing of said opening upon withdrawl of the tube without any further manipulation,

whereby endotracheal suctioning may be periodically accomplished through the ventilator conduit without having to disconnect the patient from the respirator.

4,351,329
HIGH FREQUENCY BREATH PUMP

Raymond A. Ellestad, Rialto, and Harold U. Bartels, Riverside, both of Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

Filed Nov. 6, 1980, Ser. No. 204,435
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—204.21 6 Claims



1. Apparatus for pumping breathable gas from a pressurized source into and out of the proximal airway of a patient, comprising:

conduit means adapted for fluid connection to said proximal airway;

inhalation means, fluidly connected between said source and said conduit means, for alternately (a) receiving a first selected volume of gas from said source during an expiratory phase of the respiratory cycle of said patient, and (b) delivering said first selected volume of gas to said conduit means during the subsequent inspiratory phase of the respiratory cycle;

exhalation means, fluidly connected to said conduit means, for alternately (a) withdrawing a second selected volume of gas from said conduit means during an expiratory phase of said respiratory cycle, and (b) venting said second selected volume of gas to atmosphere during the next inspiratory phase of said respiratory cycle;

driving means for driving in synchronism both of said inhalation and exhalation means alternately forcing gas therefrom during a corresponding inspiratory phase and drawing gas thereto during a corresponding expiratory phase; and

volume adjustment means for independently adjusting said first and second selected volumes.

4,351,330
EMERGENCY INTERNAL DEFIBRILLATION

Eugene N. Scarberry, 2834 Durban, Houston, Tex. 77043

Continuation-in-part of Ser. No. 873,517, Jan. 30, 1978, Pat. No. 4,231,365. This application Sep. 12, 1980, Ser. No. 186,412
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—207.15 17 Claims

1. Emergency medical apparatus, comprising:

a first electrode means adapted for positioning internally of a patient at a location above a heart,

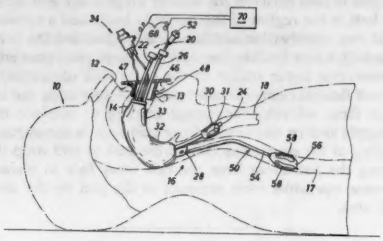
first means for urging said first electrode means into electrical contact with an adjacent body portion of said patient,

a second electrode means adapted for positioning within an esophagus at a location below said heart,

second means for urging said second electrode means into electrical contact with said esophagus,

defibrillating means for energizing said first and second electrode means, and

said first and second electrode means being relatively positionable to obtain electrical current from said defibrillating

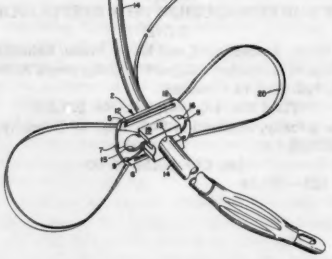


means and within said heart effective to terminate fibrillation of said heart.

4,351,331
ENDOTRACHEAL TUBE HOLDER AND BITE BLOCK

Gordon A. Gereg, 557-A Blue Church Rd., Coopersburg, Pa. 18036

Filed Oct. 31, 1980, Ser. No. 202,696
Int. Cl.[3] A61M *25/02*
U.S. Cl. 128—207.17 9 Claims



1. A tube holder for use with an endotracheal tube adapted to be inserted through the mouth of a patient, said holder being made as a one-piece structure of resilient material and capable of being moved from a locked position to an unlocked position, said holder comprising a tubular member having an outwardly projecting flange at one end thereof, said tubular member and flange having a bore extending therethrough for receiving said tube, said tube member being split axially along its entire length on one side, said flange having a first split extending from said bore to its peripheral edge and being continuous with said split in said tubular member, said flange also having a second split opposite said first split extending from said tubular member side opposite said one side defining a pivot for said tubular member to its peripheral edge, said first and second split defining alignable abutting surfaces, said tubular member and flange, and connection means for fixing said tube holder on a a patient, whereby said tube holder is unlocked by twisting said flange on either side of said second split and moving said abutting surfaces out of alignment and rotating said flange and tubular member about said pivot thereby causing said abutting surfaces defined by said first split to separate to permit insertion or removal of said tube into or from said bore and said holder is locked by pivoting said tubular member and flange in the opposite direction thereby causing said abutting surfaces defined by said second split to align.

4,351,332

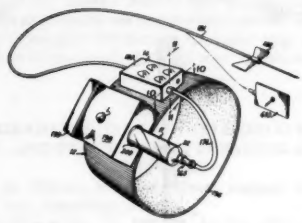
SPLIT NUT FOR INJECTOR

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,235. This application Mar. 27, 1981, Ser. No. 248,567

Int. Cl.[3] A61M 5/20

U.S. Cl. 128—214 F 5 Claims



1. Apparatus for injecting fluid into a patient at an average prescribed rate over a prolonged period of time comprising:

a housing;

carriage means defining a fluid chamber therein carrying fluid to be dispensed and an outlet from said fluid chamber connected to the patient, said carriage means defining a nut receiving opening thereon having a prescribed size and shape and including a piston slidably mounted in said fluid chamber for forcing fluid from said outlet as said piston is moved toward said outlet;

connection means for removably attaching said carriage means to said housing;

an externally threaded drive member defining an outboard end thereon adapted to engage said piston;

an internally threaded split nut unit mounted on said housing and selectively movable between a closed position threadedly engaging said externally threaded drive member and an open position threadedly disengaging said externally threaded drive member, said internally threaded split nut unit having an external size and shape and located with respect to said connection means such that, when said split nut unit is in its closed position threadedly engaging said drive member, said nut receiving opening in said carriage means will just be received over said split nut unit and said connection means maintains said carriage means over said split nut unit while said carriage means is attached to said housing to keep said split nut unit in its closed position;

driving means operatively connected to said externally threaded drive member for selectively rotating said drive member with respect to said split nut unit to cause said drive member to axially move with respect to said split nut unit and to cause the outboard end of said drive member to engage and move said piston toward said outlet and force fluid out of said outlet.

4,351,333

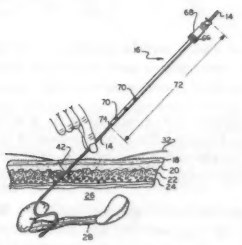
PERITONEAL FLUID TREATMENT APPARATUS, PACKAGE AND METHOD

Harrison Lazarus, 1474 Penrose Dr., Salt Lake City, Utah 84103, and James A. Nelson, 1708 Forest Hills Dr., Salt Lake City, Utah 84106, assignors to Harrison Lazarus and James A. Nelson, both of Salt Lake City, Utah

Continuation of Ser. No. 945,525, Sep. 25, 1978, abandoned, which is a division of Ser. No. 722,752, Sep. 13, 1976, Pat. No. 4,128,173, which is a continuation of Ser. No. 626,323, Oct. 28, 1975, abandoned. This application Aug. 22, 1980, Ser. No. 181,219

Int. Cl.[3] A61M 5/00

U.S. Cl. 128—214.4 2 Claims



1. A method for peritoneal fluid treatment in which:

a portion of the skin surface about the peritoneum is sterilized using skin preparation means;

a local anesthetic is administered to said sterilized skin surface;

a nick-type incision is made in the area of said sterilized skin using incision means;

a hollow first cannula is placed through said incision and just slightly into the peritoneal cavity;

flexible guide means is inserted into the peritoneal cavity through said first cannula well into said cavity, said guide means being from about 20 to 50 centimeters in length and from about 0.5 millimeters to about 2 millimeters in diameter for insertion into the peritoneal cavity through said first cannula, said guide means being sized in cross-section to fit within said first cannula and in length to be substantially longer than said first cannula, said guide means having a first end which is blunt for insertion into the peritoneal cavity, and said guide means being a stainless steel piano-wire-like wire made of a refractory metal having substantial flexibility from its first end to a point from about one-third to one-half the length of said guide means measured from said first end and thereafter said guide means has less flexibility along its length to its second end;

said first cannula is removed leaving said guide means inserted;

a second cannula which is elongated and flexible is inserted into the peritoneal cavity over said guide means, said second cannula being a flexible plastic-like tube having a plurality of spaced apart apertures formed in it from its second end to a point about one-third to one-half along its length;

said guide means is removed; and

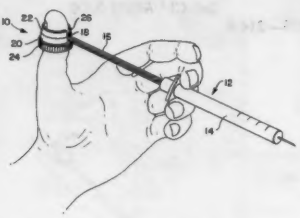
fluid operation means is connected to said second cannula by connector means adapted to one end of said cannula to effect fluid treatment operations.

4,351,334

SAFETY DEVICE FOR SECURING THUMB OR FINGER TO A SYRINGE

Joseph T. Inglefield, Jr., 210 E. Broad St., Falls Church, Va. 22046; Joseph T. Inglefield III, 4923 Arbor Ridge, San Antonio, Tex. 78228; Effie J. Heulitt, 343A Ogden Ave., Jersey City, N.J. 07307; David L. Inglefield, 6329 Linway Terr., McLean, Va. 22102

Filed Dec. 17, 1980, Ser. No. 217,563
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 PA **15 Claims**



1. A digital device for attachment to a syringe having a barrel, a plunger having a first end positioned in the barrel for reciprocation therein and a second end external to the barrel and having a head connected thereto, said digital device comprising:

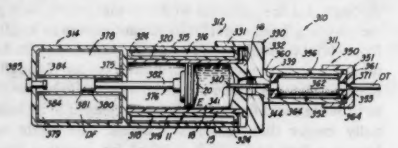
a unitary tubular member adapted to receive a thumb or finger of a user and having first and second open ends and a slot defined in the wall by said tubular member for receiving the plunger, said slot extending from a closed terminus intermediate the first and second ends of said tubular member to an open terminus at the second end of said tubular member.

4,351,335

INJECTION DEVICE AND METHOD

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 30,277, Apr. 16, 1979, Pat. No. 4,267,836, which is a division of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672. This application Mar. 23, 1981, Ser. No. 246,213
Int. Cl.³ A61M *5/20*
U.S. Cl. 128—218 A **4 Claims**



1. An injector to inject treatment fluid into a patient comprising:

carriage means defining a fluid chamber therein carrying the treatment fluid to be injected into the patient and an injection outlet from said fluid chamber connected to the patient;

an injection piston slidably mounted in said fluid chamber for forcing treatment fluid from said injection outlet into the patient as said injection piston is moved toward said injection outlet; and

drive means on said carriage means for moving said injection piston toward said outlet, said drive means including a reservoir; a drive fluid under pressure in said reservoir; a drive cylinder; a drive piston slidably mounted in said drive cylinder, and a piston rod connected to said drive piston projecting from said drive cylinder to engage said injection piston to urge said injection piston toward said injection outlet when said drive piston extends said piston rod from said drive cylinder, said drive cylinder defining a drive fluid inlet port there in communicating with the drive fluid in said reservoir and through which the drive fluid is introduced into said drive cylinder to urge said drive piston so as to extend said piston rod into engagement with injection piston and move said injection piston toward said injection outlet, said inlet port arranged so that said drive piston blocks said inlet port when said piston rod is retracted to prevent the drive fluid from extending said piston rod; and manually engagable displacement means for displacing said drive piston off of said inlet port to admit the drive fluid into said drive cylinder and extend said piston rod to move said injection piston toward said injection outlet.

4,351,336

TWIST BOTTLE DISPENSER

Vincent R. Sneider, 3422 Hallcrest Dr., NE., Atlanta, Ga. 30319

Filed Aug. 4, 1980, Ser. No. 174,806
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—232 **10 Claims**

1. A syringe or like dispensing apparatus characterized as having an axially movable nozzle with a contoured exterior end with discharge means, this nozzle having a tubular stem portion with an interior axial bore, this tubular portion having a finished inner end and providing therewith a sealing end portion, and a cap member associated with said nozzle and having a retaining aperture sized to be slidable along the tubular stem portion of the nozzle, said cap member having a tubular collar member portion extending from the retaining aperture and for a determined distance and on the end of this tubular collar portion finished so as to provide a stop end substantially normal to the axis of the collar member, and with said cap member having means for securing the cap member and nozzle to a fluid container for the discharge of a fluid in said container, the syringe having a valve construction selectively actuatable for the discharge of the fluid contents of the container, the valve construction including:

(a) a valve plug having a stem portion slidable within said axial bore of the tubular stem portion of the nozzle, the stem portion of the valve plug having longitudinal fluid passageways formed along and in the exterior surface of said stem portion, these passageways providing means for conducting fluid from the container to the interior of the nozzle when these passageways are exposed to the fluid within the container;

(b) a first seal means on said valve plug and disposed circumferentially around said valve plug and below said longitudinal passageways, this seal means adapted to engage the interior bore of the tubular portion of the nozzle and slide therealong and therein;

(c) a second seal means formed on said valve plug and at a determined distance from said first seal means and substantially at the end opposite the stem portion, this seal means extending outwardly and having surface means

disposed to engage the finished stop end on the nozzle to effect a fluid seal;

(d) an annular flange portion formed on said valve plug and outwardly of said second seal means and sized and disposed to engage the stop end of the collar member of the cap, and

(e) cooperating means formed on the stop end of the collar and the annular flange of the valve plug, said cooperating means providing a fluid pathway from the container to the exterior of the valve plug, and the first and second seal means is effective when the valve plug is fully inserted and there is no fluid flow through the cooperative means to the interior of the nozzle, outward partial movement of the nozzle makes the second seal means ineffective while the first seal prevents fluid flow into the fluid passageways and further outward movement of the nozzle renders the first seal means ineffective and no longer inhibits fluid flow as and when the first seal means is moved from in way of the interior bore of the tubular portion of the nozzle and fluid flows into the longitudinal fluid passageways formed in the stem of the valve plug and into the interior of the nozzle for discharge therefrom.

4,351,337

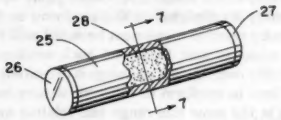
BIODEGRADABLE, IMPLANTABLE DRUG DELIVERY DEVICE, AND PROCESS FOR PREPARING AND USING THE SAME

Kenneth R. Sidman, Wayland, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 596,444, Jul. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 361,182, May 17, 1973, abandoned. This application Sep. 11, 1980, Ser. No. 186,152

Int. Cl.³ A61K *9/00*

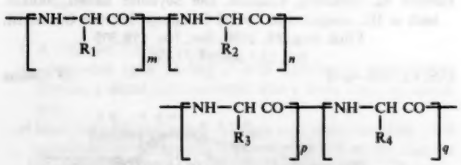
U.S. Cl. 128—260 **38 Claims**



1. An implant device for the controllable release of at least one substance into a living host into which it is implanted, comprising

(a) a substance to be released within a living host; and

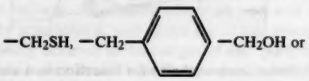
(b) a matrix material prepared from a block copolymer of the formula



where R_1, R_2, R_3 and R_4 are

$-H$, $-CH_3$, $-CH_2COOH$, $-CH_2CH_2COOH$,

$-CH_2C(CH_3)CH_3$, $-CH_2CH_2CH_2CH_2NH_2$, $-CH_2CH_2SCH_3$,



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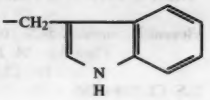
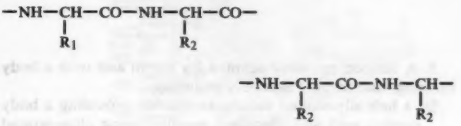


and m, n, p and q range between 1 and 100, or a copolymer of two or more α-amino acids distributed at random along the chain of the formula



wherein R_1 and R_2 are defined above, which is biocompatible and biodegradable within the host environment into which it is implanted; does not form covalent bonds with said substance to be released; has an average molecular weight of 20,000 to 1,000,000; and is essentially free of any carrier of said substance, said substance being distributed within said matrix to provide a controlled rate of release for systemic utilization within said host by diffusion, hydrolysis or a combination thereof of said matrix material said implant device being shaped as an injectable configuration.

4,351,338

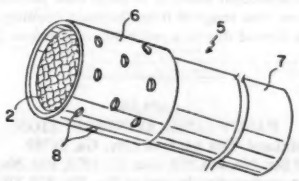
VAGINAL TAMPON

Pierre Langlois, 24, rue de Clichy, 75009 Paris, and Marc Mollet, 38, rue des Chevaliers de Saint Jean, 91100 Corbeil, both of France

Filed May 21, 1980, Ser. No. 151,893

Int. Cl.³ A61F *13/20*

U.S. Cl. 128—285 **15 Claims**



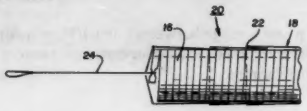
1. A vaginal contraceptive tampon, comprising a synthetic sponge member made of a cellular material having semi-open cells and impregnated with a compound of a spermicidal composition and of a delaying medium having gelifying properties when moistened;

the semi-open cells providing only sinuous intricate internal communication paths among the cells and to exterior, thereby lowering emission of the compound when gelified and acting to delay releasing action of the delaying medium and due to which the sponge member, if compressed in a not-moistened condition remains more durably compressed yet rapidly swells when moistened, all in comparison with the same sponge member if made of open cell foam.

4,351,339
TAMPON WITH A PROTECTIVE ACCORDION-STYLE COVER

Vincent R. Sneider, 3422 Hallcrest Dr., Atlanta, Ga. 30319

Filed Apr. 14, 1981, Ser. No. 254,102
Int. Cl.[3] A61F *13/20*
U.S. Cl. 128—285 7 Claims



1. A tampon assembly adapted for use in and with a body opening, said tampon assembly including:

(a) a helically-wound absorbent member providing a body portion with said absorbent member being close-wound with the side portions thereof substantially parallel and in an assembled condition providing a substantially continuous and contiguous outer surface, said member having sufficient memory to withstand insertion manipulation;

(b) a withdrawal string attached at one end to that end on the helically-wound absorbent member that is disposed to face said body opening;

(c) a permeable cover having a closed end contoured and prepared for entry into said body opening, said cover disposed adjacent to the absorbent member and enclosing and retaining said withdrawal string, the cover having a plurality of pleated or accordion folds providing overlays arranged so that in an inserting condition the pleats or folds in the cover are disposed to remain in their overlaid condition and remain so during use, and with this cover closed sufficiently at a second end so as to snugly capture the withdrawal string to prevent unwanted exiting of the absorbent material through said closure, and

(d) means for inserting the tampon into a body opening and when the tampon is to be withdrawn from said body opening the withdrawal string is grasped and pulled to commence withdrawal of the tampon whereat the helically-wound absorption member is sufficiently uncoiled to at least partially collapse said member into a smaller diameter with the attached string also engaging and withdrawing the pleated cover in which the pleats unfold as the overlaid cover is moved outwardly to bring said cover into a substantially straightened condition and causing the coiled absorbent material to be at least partially straightened out thus removal from the body opening is comfortably achieved due to a reduction of diameter of the tampon.

4,351,340
PANTY LINER CONSTRUCTION

Syble A. McLeod, Box 64, Iron City, Ga. 31759

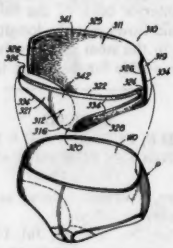
Division of Ser. No. 914,593, Jun. 12, 1978, Pat. No. 4,227,531, which is a continuation-in-part of Ser. No. 825,578, Aug. 18, 1977, abandoned. This application Oct. 7, 1980, Ser. No. 194,875
Int. Cl.[3] A61F *13/16;* A41B *9/04*
U.S. Cl. 128—288 4 Claims

1. A panty liner for use in a panty having a fabric layer, and defining a waist opening at its top, and a pair of leg openings at its bottom comprising:

a non-stretchable panel assembly including a front section, a back section and a crotch section joining the front and back sections; said panel assembly adapted to fit inside and conform generally to the shape of the panty defining a pair of leg cutouts therein to conform to a portion of the leg openings in the panty when the panty liner is installed in the panty, said front section defining opposed front side edges thereon and a front upper edge thereon extending between said front side edges; and said back section defining opposed rear side edges thereon and a rear upper edge thereon extending between said rear side edges, said panel assembly sized so that when said panel assembly is positioned inside the panty, said leg cutouts conform to a portion of the leg openings in the panty, said front and rear side edges extend upwardly from the top of the leg openings in the panty toward the waist opening with said front and rear side edges over each leg opening in the panty spaced from each other, and said front upper edge spaced below and generally parallel to the waist opening above the tops of the leg openings in the panty; said panel assembly including:

an interior liquid absorbent layer; and

an exterior liquid impermeable layer between and separating the fabric layer of the panty from said interior absorbent layer to prevent liquids absorbed by said interior absorbent layer from penetrating the fabric layer of the panty; and

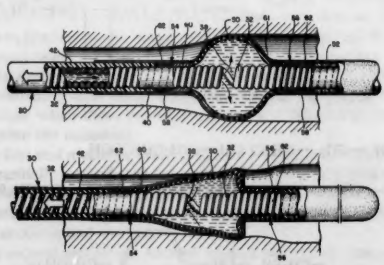


adhesive strip means extending along said front and rear side edges and said front and rear upper edges on the exterior of said panel assembly to stick said panel assembly to the fabric layer of the panty and thus removably attach said panel assembly to the fabric layer of the panty so that said panel assembly is supported on and conforms to the fabric layer whereby relative movement between said front and back side edges of said front and back sections of said panel assembly over the leg openings is permitted to allow the panty liner to conform to different wearer body configurations in the same size range and relative movement of said upper edge on said front section with respect to the waist opening in the panty is permitted to permit the panty liner to adjust to different abdomen configurations in the same size range.

4,351,341
BALLOON CATHETER

Edward M. Goldberg, Glencoe, and Seymour Bazell, Skokie, both of Ill., assignors to UreSil Company, Morton Grove, Ill.

Filed Aug. 15, 1980, Ser. No. 178,305
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—348 25 Claims



1. An embolectomy catheter for insertion in a vascular passage, said catheter adapted to be pulled through said vascular

passage to remove material therefrom, said catheter comprising:

an inflatable balloon sized to fit within the body passage;

an elongated support member having a diameter sized to fit within the body passage; and

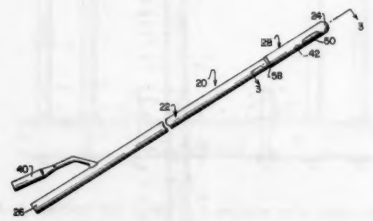
means for securely mounting the balloon to the support member;

said support member having means included therein for permitting the support member to perceptibly elongate in response to an applied stretching force greater than a first value while exhibiting substantially no perceptible elongation in response to an applied stretching force less than a second value, no greater than the first value, said second value chosen to allow the catheter to be pulled through the vascular passage without perceptibly elongating the support member such that the support member does not perceptibly elongate in use when safe stretching forces are applied to the support member in pulling the balloon through the vascular passage, said first value chosen such that the support member perceptibly elongates when an excessive stretching force is applied to the support member in pulling the balloon through the vascular passage, thereby providing a tactile indication to a user that an excessive force is being applied.

4,351,342
BALLOON CATHETER

Bruce E. Wiita, Box 3669, Jupiter, Fla. 33458, and J. Michael Teets, 12104 Gardenway G-7, Palm Beach Gardens, Fla. 33410

Filed Jun. 10, 1981, Ser. No. 272,127
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 B **20 Claims**



1. A catheter, comprising:

an elongated tube having a wall defining a main lumen therein, a distal end insertable into a body and a proximal end;

at least one port extending through said wall providing fluid communication between said main lumen and the exterior of said tube, said port being defined by edges and being located adjacent said distal end;

an inflatable balloon having a tubular portion, one closed end and one open end, said balloon being mounted on and enveloping said tube distal end, and being adhered to said tube on the side of said port remote from said distal end about said open end;

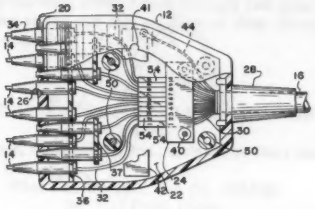
at least one opening extending through said tubular portion of said balloon and aligned with said port and being defined by a periphery, said periphery of said opening being completely adhered to said edges of said port; and

an inflation lumen in said tube for conducting fluid pressure to and from said balloon.

4,351,343
ECG PATIENT MONITORING LEAD ASSEMBLY

Michael R. Parrillo, Endwell, N.Y., and John C. Colwell, Hoffman Estates, Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 2, 1980, Ser. No. 183,137
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—695 **18 Claims**



1. An ECG patient monitoring lead assembly comprising:

a plurality of individually replaceable patient monitoring leads;

a junction box for receiving a plurality of ECG leads and said plurality of patient monitoring leads;

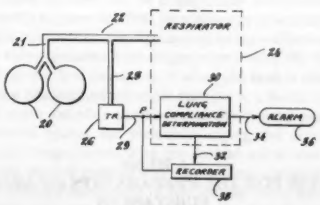
connection means in said junction box for electrically interconnecting corresponding ones of said monitoring leads and said ECG leads; and

strain relief means independent of said connection means for isolating said connection means from forces transmitted by said patient monitoring leads.

4,351,344
METHOD AND APPARATUS FOR MONITORING LUNG COMPLIANCE

Alex Stenzler, Syosset, N.Y., assignor to Bio-Med Devices, Inc., Stamford, Conn.

Filed Nov. 13, 1980, Ser. No. 206,393
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—720 **19 Claims**



1. A device for deriving an indication of the compliance of a patient's lungs while a respirator provides a supply of gas to the patient and with the use of a pressure sensor operatively coupled to the patient's airway to produce a pressure signal represenatative of the patient's airway pressure as a function of time during the inspiratory phase of the breathing cycle and wherein a slope of the pressure signal during the inspiratory phase is representative of the compliance of the patient's lungs, comprising:

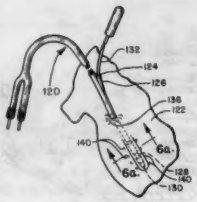
means responsive to the pressure signal for periodically effectively measuring said slope for respectively different breathing cycles and generating pressure wave index signals representative thereof as indicative of the compliance of the patient's lungs; and

means responsive to said pressure wave index signals to register an indication thereof.

4,351,345
METHODS OF SECURING ELECTRODES TO THE HEART

Andrew L. Carney, 222 Forest Ave., Oak Park, Ill. 60302

Continuation-in-part of Ser. No. 949,661, Oct. 10, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,410
Int. Cl.³ A61N 1/04
U.S. Cl. 128—786 8 Claims



1. A method for securing cardiac leads to a heart which includes a ventricle which is in fluid communication with an associated atrium via a valve, said method comprising the following steps:
providing an atrial-ventricular pulse generator having an atrial lead and a ventricular lead;
gaining access to the atrium;
securing the atrial lead to the atrium to provide electrical contact between the pulse generator and the atrium via the atrial lead;
sugically creating an opening in the atrium;
passing the ventricular lead through the surgically created opening into the atrium, through the valve and into the ventricle to provide electrical contact between the ventricle and the pulse generator via the ventricular lead; and
closing the surgically created opening around the ventricular lead to secure the ventricular lead in place and to substantially prevent the leakage of blood out of the atrium around the ventricular lead.

4,351,346
PROCESS FOR THE PREPARATION OF AROMATIC SUBSTANCES

Ursula Brummer, Halstenbek, and Volker Heeman, Reinbek, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,853
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009031
Int. Cl.³ A24B 3/12, 15/22, 15/24, 15/28
U.S. Cl. 131—276 20 Claims

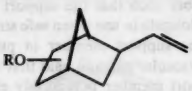
1. A process for the preparation of aromatic substances from an alcoholic chlorophyll and carotenoid containing extract from tobacco plant material comprising the steps of:
(a) removing the waxy diterpene components present on the surface of the tobacco plant,
(b) Extracting the diterpene free tobacco plant with alcohol;
(c) removing the chlorophyll from said extract, and
(d) exposing said extract to a source of ultraviolet light and to a source of oxygen.

4,351,347
ORGANOLEPTIC USES OF NORBORNYL ETHERS AND ESTERS

Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 247,321, Mar. 25, 1981, Pat. No. 4,315,945, which is a continuation-in-part of Ser. No. 200,012, Oct. 23, 1980, Pat. No. 4,311,861. This application Oct. 13, 1981, Ser. No. 311,145
Int. Cl.³ A24B 3/12, 15/30
U.S. Cl. 131—276 3 Claims

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to a smoking tobacco an aroma augmenting or enhancing quantity of a mixture of compounds represented by the structure:

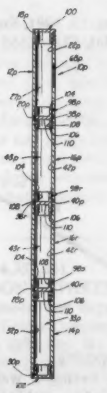


wherein in one of the molecules of the mixture the "OR" moiety exists at the "5" position on the norbornyl ring structure, and in the other of the molecules of the mixture the "OR" moiety exists at the "6" position on the norbornyl ring structure; and wherein R represents a moiety selected from the group consisting of acetyl, propionyl and allyl; and wherein in the mixture the R moieties are identical.

4,351,348
SURVIVAL STICK

Hoyt W. Axton, P.O. Box 614, Tahoe City, Calif. 95730

Filed Jan. 4, 1980, Ser. No. 109,570
Int. Cl.³ A45B 7/00
U.S. Cl. 135—66 2 Claims



1. A survival stick adapted for storing items comprising:
an upper section having an upper end, a lower end and an opening extending through the upper end and the lower end thereof and extending a distance therethrough, the opening being shaped and disposed to form a compartment in the upper section adapted for storing items;
a lower section having an upper end, a lower end and an opening extending through the upper end and the lower end thereof and extending a distance therethrough, the opening being shaped and disposed to form a compartment in the lower section adapted for storing items;
at least one intermediate section, each intermediate section having an upper end, a lower end and an opening extending through the upper end and the lower end thereof and extending a distance therethrough, the opening being shaped and disposed to form a compartment in the inter-

mediate section generally between the upper and the lower ends, the compartment being adapted for storing items, the upper end of one of the intermediate sections being removably connectable to the lower end of the upper section and the lower end of one of the intermediate sections being removably connectable to the upper end of the lower section and the upper end of the remaining intermediate sections being removably connectable to the lower end of the remaining intermediate sections for removably connecting the upper section, the intermediate section and the lower section to form a survival stick; and

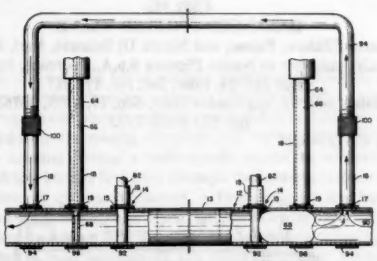
at least two collars, each having a base, one collar being insertable within a portion of the opening in the upper sections generally near the lower end of the upper section for connecting the collar to the upper sections and insertable within a portion of the opening in one of the intermediate sections generally near the upper end of the intermediate section for connecting the collar to the intermediate section thereby connecting the upper section to one of the intermediate sections, and one of the collars being insertable within a portion of the opening in the lower section generally near the upper end of the lower section for connecting the collar to the lower section and insertable with the opening in one of the intermediate sections generally near the lower end of the intermediate section for connecting the collar to the intermediate section and for connecting the lower section to one of the intermediate sections.

4,351,349

PIPE REPAIR KIT APPARATUS AND METHOD

Peter L. Minotti, R.D. 1, Box 75, Easton, Pa. 18042

Filed Nov. 10, 1980, Ser. No. 205,199
Int. Cl.³ F16L *55/10, 55/18;* F16K *43/00*
U.S. Cl. 137—15 **16 Claims**



14. A method for isolating a portion of a pipe requiring repair, comprising the steps of:

(a) securing a pair of first releasable reclosable gripping means about said pipe exterior at positions respectively upstream and downstream of said repair portion;

(b) boring first holes in said pipe at said respective first gripping means;

(c) inserting shafts across said pipe interior through said respective bored first holes;

(d) securing a pair of second releasable reclosable gripping means about said pipe exterior at positions respectively further upstream and downstream of said respective first gripping means;

(e) boring second holes in said pipe at said respective second gripping means;

(f) connecting said respective second holes with a bypass conduit for flow of said fluid around said pipe portion requiring repair;

(g) securing a pair of third releasable reclosable gripping means about said pipe exterior at positions respectively upstream and downstream of said repair portion, each of said third gripping means being between said respective first and second gripping means upstream and downstream of said repair portion;

(h) boring third holes in said pipe at said respective third gripping means;

(i) inserting inflatable bladder means into said pipe interior through said third holes; and

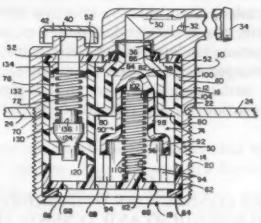
(j) inflating said respective bladder means until said respective bladder means contact said respective proximate shafts and occupy the cross sectional area of said pipe thereby blocking flow of fluid through said pipe portion requiring repair and causing flow of fluid through said bypass conduit.

4,351,350

VALVING ASSEMBLY FOR A LIQUID-CONTAINING TANK

Billy G. Crute, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jan. 16, 1981, Ser. No. 225,848
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—39 **14 Claims**



1. A valving assembly for a liquid-containing tank, comprising a housing generally divided into first and second axially extending passageways providing separate paths of communication between the inside and outside of the tank, the housing being formed to provide a first inwardly facing valve seat in the first passageway and a second axially outwardly facing valve seat in the second passageway, a first valve member positioned in the first passageway, a first spring for supporting the first valve member out of engagement with the first valve seat normally to open the first passageways when the tank is in an upright orientation, the first spring being calibrated to urge the first valve member into engagement with the first valve seat to close the first passageway when the tank is tilted downwardly to a predetermined angle relative to a horizontal plane, a second valve member positioned in the second passageway, and a second spring for yieldably urging the second valve member into engagement with the second valve seat normally to close the second passageway, the second spring being calibrated to provide movement of the second valve means out of engagement with the second valve seat when the pressure in the tank exceeds a predetermined superatmospheric level.

4,351,351

BREAKAWAY PIPE COUPLING WITH AUTOMATICALLY CLOSED VALVES

John F. Flory, Morris Township, Morris County, and Steven P. Woehleke, Convent Station, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 7, 1980, Ser. No. 175,946
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **12 Claims**

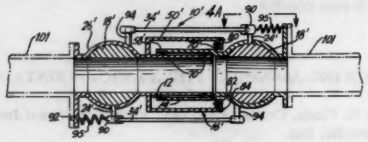
1. A breakaway pipe coupling comprising:

(a) first and second pipe sections, said first pipe section coaxially joining with said second pipe section in a sealed relationship;

(b) valve means situated within at least one of said pipe sections for regulating fluid flow therethrough;

(c) retaining means associated with said valve means for holding said valve means in an opened position when said first and second sections are joined together; and

(d) load control means extending between said first and second pipe sections for securing said sections together, said load control means including a cylindrical housing secured to one of said pipe sections and extending axially over the other of said pipe sections, a radially extending cutting collar formed at one end of said cylindrical housing, said cutting collar engaging an exterior portion of the



other of said pipe sections and cutting thereinto when said pipe sections separate, said load control means adapted to yield in response to a sustained tensile load exceeding a predetermined limit, thereby allowing said pipe sections to separate at a rate dependent on the magnitude and rate of said tensile loading and whereby said retaining means are disengaged and said valve means are permitted to shut, thereby terminating flow through said pipe sections at a rate proportional to the rate at which said sections separate.

4,351,352

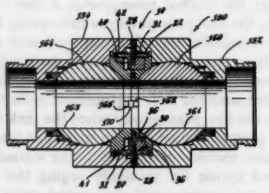
FRANGIBLE CONNECTORS WITH INDEPENDENTLY SELECTABLE BENDING AND TENSION SEPARATION LOADS

Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477

Division of Ser. No. 900,329, Apr. 26, 1978, Pat. No. 4,232,697. This application Jul. 28, 1980, Ser. No. 172,530

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 R **3 Claims**



1. A self-closing breakaway valve assembly comprising:

(A) a first valve housing having a first rotatable valve member rotatably mounted therein, said first valve housing and first rotatable valve member each having a bore formed therethrough, said bores being aligned when said first rotatable valve member is in an open position to provide a passage through said first valve housing, said first rotatable member spring biased to rotate to a closed position wherein the bores of said first rotatable valve member and said first valve housing are misaligned to block passage through said first valve housing;

(B) a second valve housing having a second rotatable valve member rotatably mounted therein, said second valve housing and said second rotatable valve member each having a bore formed therethrough, said bores being aligned when said second rotatable valve member is in an open position to provide a passage through said second valve housing, said second rotatable valve member spring biased to rotate to a closed position wherein the bores of said second rotatable valve member and said second valve housing are misaligned to block the passage through said second valve housing;

(C) a moment arm ring having axially-disposed inside and outside cylindrical surfaces, said moment arm ring closely received in an annular groove having mating cylindrical surfaces defined by said first valve housing thereby establishing an axially disposed interface therebetween, said first valve housing secured to said moment arm ring by tension-mode frangible means extending from the exterior surface of the first valve housing across at least the outer of the axially-disposed interface between said first housing and the moment arm ring, the moment arm ring also having a radially disposed surface;

(D) bending-mode releasable means connecting said second valve housing to said moment arm ring with a radially disposed surface of said second valve housing interfaced with the radially disposed surface of the moment arm ring; and

(E) trigger means holding said first and second rotatable valve members in their open positions when said first and second valve housings are secured together and releasing to permit said first and second rotatable valve members to rotate to their closed positions when said first and second valve housings are separated; whereby application of a tension load of sufficient magnitude causes the tension-mode frangible means to sever permitting the first and second valve housings to separate and the first and second rotatable valve members to close, and whereby application of a bending load of sufficient magnitude causes the bending-mode releasable means to sever and permit the first and second rotatable valve members to separate and the first and second rotatable valve members to close, wherein the magnitude of the tension load and bending load necessary to separate the first and second valve housings is independently selectable.

4,351,353

BALANCED-SPOTTER VALVE

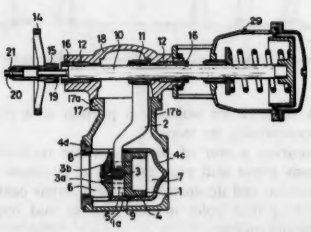
Roberto Filidoro, Palese, and Nicola Di Sciascio, Bari, both of Italy, assignors to Nuovo Pignone S.p.A., Florence, Italy

Filed Jul. 24, 1980, Ser. No. 172,017

Claims priority, application Italy, Sep. 17, 1979, 25762 A/79

Int. Cl.³ F16K *1/12*

U.S. Cl. 137—219 **9 Claims**



1. A control valve having ports through which fluid flows, comprising

plug means and an operating stem within the valve, wherein said stem is displaced from said plug and is adapted to move said plug means parallel thereto, and wherein said plug means is movable coaxially to the direction of fluid flow for uncovering and covering the ports in the valve to control the flow of fluid therethrough, and wherein said plug means includes bore means therethrough for balancing fluid pressure on its opposing ends and an intermediate radial cavity therein,

a lever between said stem and plug means fixedly connected to said steam and extending into said radial cavity of said plug means for transferring the movement of said stem to

said plug means, wherein said lever is flexible for adjusting and maintaining the parallel movement between said stem and plug means, and

point contact means in said radial cavity for connecting said lever to said plug means, wherein said point contact means further ensures the proper movement of said plug means.

4,351,354
SUPPLY CONTROL APPARATUS FOR A MIXING CHAMBER

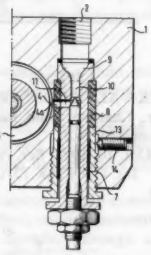
Karl-Heinz Hilterhaus, Georgsmarienhütte, and Reinhard Möser, Belm, both of Fed. Rep. of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck, Fed. Rep. of Germany

Filed Jul. 27, 1979, Ser. No. 61,424

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1978, 2832901; Jun. 27, 1978, 2853783

Int. Cl.³ B08B *3/04;* **F16K** *19/00*

U.S. Cl. 137—240 **5 Claims**



1. A valve device for alternately supplying a chemical reactant to a mixing chamber associated therewith and a liquid for flushing the chamber to remove reactant and reaction products thereof from the mixing chamber, said valve device comprising a housing having a wall which encloses a substantially cylindrical bore, a first inlet through the housing into the bore for flow of chemical reactant, a first outlet in the housing spaced circumferentially from the first inlet for flow of reactant from said first inlet connected to said mixing chamber for transfer of said reactant to the mixing chamber through a conduit free from zones which create an area of quiesence where solid dispersed in the liquid flowing therethrough tends to settle out of the liquid and accumulate in the quiescent area, a second inlet through the housing for permitting a flow of flushing medium into said bore and a second outlet circumferentially spaced from the first inlet, recirculation of said reactant from the first inlet, and a valve core disposed in said bore, said valve core having a surface which is concentric with the said wall of the housing which encloses said bore, said walls of the valve core and housing disposed with an interface therebetween, said valve core being rotatable about its axis in the bore and having a first duct free from areas of quiescence which when said core is rotated to one position in the bore connects said first inlet with said first outlet for flow of reactant to said mixing chamber while blocking said second inlet and when the valve core is rotated to a second position connects said first inlet with said second outlet for recirculating said reactant between said first inlet and said second outlet, said valve core having a second duct disposed for connecting said second inlet with said first outlet for permitting the flow of flushing medium to the mixing chamber, and means for sealing said interface.

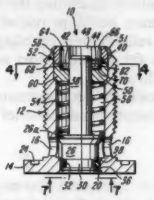
4,351,355
DRAIN VALVE

Floyd G. Koller, and Ralph H. Drew, Jr., both of Dayton, Ohio, assignors to Auto-Valve, Inc., Dayton, Ohio

Filed Jun. 12, 1980, Ser. No. 158,787

Int. Cl.³ F16K *31/528, 43/00*

U.S. Cl. 137—329.06 **13 Claims**



11. A drain valve, comprising:

a housing having a drain port at its lower end;

a valve member;

a seal on said valve member;

said valve member being movable along the axis of said port from a first position wherein it closes said port to a second position above said port so that liquid may pass through said port, and to a third position wherein it is extended through said port to permit replacement of said seal;

an axially extending stem connected at one end to said valve member;

a pin adjacent the other end of said stem and having at least one end projecting from said stem in a direction generally perpendicular to the axis of said stem;

a retainer assembly mounted in said housing in fixed relation to said port and having an axial through-bore for receiving said stem and having passage means extending from the top of said retainer assembly to the bottom of said retainer assembly;

said passage means comprising means forming a first slot extending along and opening to a first portion of said through-bore and also opening to the top of said retainer assembly for receiving said pin and a second slot extending along and opening to a second portion of said through-bore and also opening to the bottom of said retainer assembly for receiving said pin, said first slot being circumferentially spaced from said second slot, and means forming passageway portions intermediate the top and bottom of said retainer assembly connecting said first slot to said second slot;

a spring trapped between said retainer assembly and said valve member for biasing said valve member downwardly;

said retainer assembly having abutment surfaces confronting said first slot to support said valve member in said first position; and

said valve member being manipulable against the bias of said spring to open said port with said pin projecting into said first slot and said valve member being further manipulable by rotation to pass said pin through said passageway portions into alignment with said second slot to enable lowering of said valve member to expose said seal.

4,351,356
PRESSURE CONTROL VALVE

Hideshi Koiwai, Toda; Shizuo Matsumura, Konosu, and Haruhiko Kawasaki, Sagamihara, all of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,130

Claims priority, application Japan, Jul. 25, 1979, 54-94502

Int. Cl.³ F16K *17/18*

U.S. Cl. 137—491 **6 Claims**

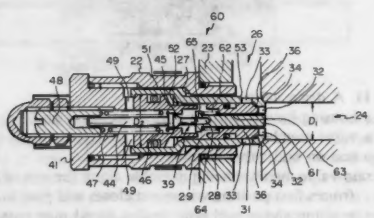
1. A pressure control valve including:

a housing defining a pressure port, a relief port and a back pressure chamber;

a relief poppet biased to block communication between the pressure port and the relief port, a first end of the relief poppet communicating with the pressure port and a second end of the relief poppet communicating with the back pressure chamber;

a piston poppet slidably extending through the relief poppet, a radial clearance being provided between the piston poppet and the relief poppet enabling restricted communication between the pressure port and the back pressure chamber therethrough;

a pilot poppet biased to block communication between the back pressure chamber and the relief port, the pilot poppet



being moved when a pressure in the back pressure chamber is above a biasing force to unblock communication between the back pressure chamber and the relief port, the relief poppet being moved by said pressure difference to unblock communication between the pressure port and the relief port, adjacent ends of the pilot poppet and the piston poppet being maintained in constant engagement with each other;

said adjacent end of the pilot poppet being formed with a coaxial conical projection, said adjacent end of the piston poppet being formed with a coaxial recess conjugate to the conical projection; and

biasing means for urging the piston poppet into engagement with the pilot poppet;

the biasing means comprising a spring.

4,351,357

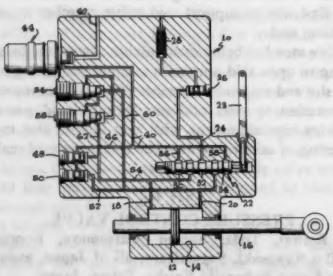
FAIL SAFE COMPENSATOR USED IN A HYDRAULIC SERVO CONTROL SYSTEM

Myrl E. Orme, Canoga Park, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Mar. 27, 1981, Ser. No. 248,611

Int. Cl.³ F15B *1/02*

U.S. Cl. 137—446 **9 Claims**



1. A hydraulic system for controlling the position of a member including a hydraulic cylinder with a piston movable therein connected to said member, a control valve connected to a source of hydraulic fluid under high pressure and to a low pressure source and fluid conduits connecting said control valve to said sources and to both sides of said piston in said cylinder, and

a compensator valve connected in a fluid conduit between said control valve and said low pressure source, said compensator valve including a housing, a piston in said housing urged in a first direction by the fluid return pressure on the low pressure side of said control valve, resilient means urging said piston in a second direction, a check valve in said housing, second resilient means urging said check valve in a position to close said fluid conduit, and means movable with said piston in response to a desired level of said fluid return pressure operable to contact said check valve and open said fluid conduit,

characterized in that said check valve comprises a seat forming part of said fluid conduit and a poppet closing on said seat, the diameter of said seat being significantly less than the diameter of said poppet, a working area of said poppet between its outside diameter and the diameter of said seat being exposed to fluid return pressure such that, were said piston to stick in said housing, said fluid return pressure will increase to a value sufficient to force said poppet open against the force of said second resilient means.

4,351,358

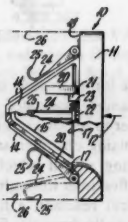
CHECK-VALVE CONSTRUCTION

Francis H. Ogle, Jr., Chardon, Ohio, assignor to Transamerica DeLaval Inc., Princeton, N.J.

Filed Oct. 10, 1979, Ser. No. 83,539

Int. Cl.³ F16K *15/03*

U.S. Cl. 137—512.1 **4 Claims**



1. A check-valve assembly, comprising an annular valve body with a fluid-flow passage bore extending therethrough between upstream and downstream ends of said body, valve-seat formations including at least three seat-post legs of length exceeding the bore radius, said legs being connected to said body at angularly spaced locations and being connected to each other at a location on the downstream side of said body, whereby adjacent pairs of said legs define generally triangular seat openings to share flow via said passage, hinge means carried by said body at the base of each of said seat openings, separate valve members independently hinged to said body via the hinge means associated with each seat opening, said valve members having a valve-closing position in coaction with said seat formations for blocking fluid flow in the upstream direction and said valve members having a valve-open position for passage of fluid flow in the downstream direction, said legs being connected to the downstream end of said body and the downstream end of said body extending chordally between adjacent leg connections thereto, said hinge means at each opening comprising a hinge post extending downstream from the associated chordally extending portion of said body, spaced hinge arms on the associated valve member straddling the hinge post, and a pintel through said arms and hinge post.

4,351,359
FAST CLOSING VALVE FOR GASEOUS AND LIQUID MEDIA

Manfred Scherwarth, Fichtenweg 31, Sulzbach/Saar, Fed. Rep. of Germany (6603)

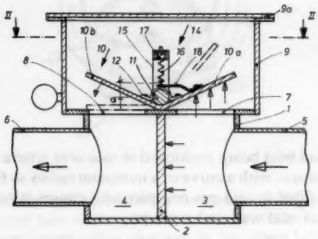
PCT No. PCT/DE79/00040, § 371 Date Dec. 17, 1979, § 102(e) Date Dec. 17, 1979, PCT Pub. No. WO79/00935, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 14, 1979, Ser. No. 177,770

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816373

Int. Cl.³ F16K *17/26*; A62B *13/00*

U.S. Cl. 137—521 **10 Claims**



1. A rapid acting valve for a fluid media which closes in response to a sudden pressure difference in a fluid flow line, said valve comprising:

a valve housing having a fluid passage therethrough;

a baffle plate positioned in said housing transverse to the flow of fluid media and dividing said housing into two antechambers;

a common valve chamber in fluid communication with each of said antechambers, each antechamber opening into said common valve chamber through a separate diverting orifice;

an angular valve disk rotatably mounted in said common valve chamber with the axis of rotation of said valve disk lying in the plane formed by said baffle plate and between the diverting orifices;

said valve disk including at least two leg portions, at least one leg portion being inclined with respect to the other and having a configuration which conforms to and closes an associated diverting orifice;

means for spring biasing said valve disk in a rotationally stable open position with both of said leg portions being inclined with respect to the plane passing through the associated diverting orifices whereby a pressure pulse resulting from pressure differences within the line is intercepted by said baffle plate thereby reducing the resulting pressure increase which impacts one of said inclined legs through an associated diverting orifice to rotate said disk against the force of said spring bias means thus closing said valve.

4,351,360
FLUID TIMER

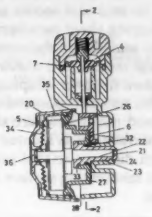
Donald N. Smyth, South Plympton, Australia, assignor to Sabco Limited, Albert Park, Australia

Filed Dec. 8, 1980, Ser. No. 214,007

Int. Cl.³ F16K *31/48*

U.S. Cl. 137—624.12 **4 Claims**

1. A fluid timer for controlling the flow of a fluid, said fluid timer having a body, an inlet passage connected to an annular valve seat, an outlet passage leading from the valve seat, a valve member adapted to seal on said seat under the influence of a spring, a timer mechanism, a cam member driven by said timer mechanism, and a push rod operated by said cam member to move said spring to allow said valve member to open by fluid pressure in the inlet characterized by said timer mechanism being mounted in and drivingly connected to a housing having an opening, and a cap closing said opening, said housing forming said cam chamber, and there being a sealing diaphragm sealed between said housing and cap and with said housing forming a sealed compartment for said timer mechanism.



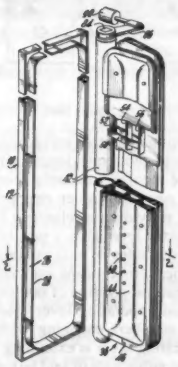
4,351,361
VALVE WITH SPRING GATE

Arthur C. Worley, Mendham, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 726,488, Sep. 24, 1976, abandoned, which is a continuation of Ser. No. 559,314, Mar. 17, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,557

Int. Cl.³ F16K *1/18, 11/02*

U.S. Cl. 137—625.44 **6 Claims**



1. A valve comprising endless valve seat means having an outer fastening region adapted to be fastened to the surface of a duct through which a fluid is adapted to flow in a predetermined direction and an inner seat region situated inwardly of said outer fastening region and terminating in an endless seating surface located in a predetermined plane generally perpendicular to the direction of fluid flow through the duct, so that said seating surface defines an opening through which the fluid is adapted to flow, valve closure means having a closed position engaging said seating surface and closing said opening defined thereby, said valve closure means including a dished member of springy sheet material having a hollow interior directed toward said opening defined by said seating surface in the closed position of said closure means, said dished springy member having a central region situated upstream of said plane and a springy endless peripheral region situated in said plane in engagement with said seating surface when said closure means is in said closed position thereof, said springy endless peripheral region being situated, in the unstressed condition of said springy sheet material, in a plane located at a given distance from the central region of said dished member, seat means being formed at least in the region of said seating surface with

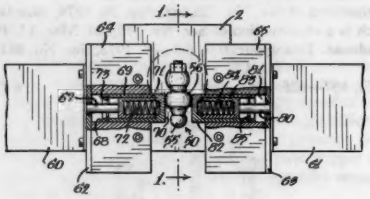
a plurality of slits distributed along and extending inwardly from said seating surface so that said seat means is free to contract and expand at said slits, and a plurality of covering sheet members fixed to said seat means and bridging said slits thereof with said covering sheet members having curved portions extending across said slits to accommodate expansion and contraction of said seat means, and moving means operatively connected to said dished member of springy sheet material for moving the latter from an open position displaced away from said opening to a closed position where said peripheral region engages said seating surface and is located closer to said central region than said given distance so that said springy peripheral region presses against said seating surface in the closed position of said closure means.

4,351,362

ROTARY VALVE

James C. Solie, and Samuel B. McClocklin, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Oct. 3, 1980, Ser. No. 193,753
Int. Cl.³ F15B *13/044*; F16K *31/02*
U.S. Cl. 137—625.65 **4 Claims**



3. A rotary directional control valve operable by a solenoid of medium force and moderate length stroke comprising, a valve body, a valve member rotatably mounted in said valve body, a two-stage operating lever operatively connected to said valve member providing a relatively long lever arm and an intermediate shorter lever arm, a pair of actuator members positioned at opposite sides of said operating lever and each movable along a line, spring means associated with said members establishing a neutral position of said members and operating lever wherein said operating lever extends normal to said line, said actuator members engaging with the shorter lever arm when said operating lever is extending normal to said line or at a small angle to either side of said last-mentioned position, and a pair of normally energized solenoids associated one with each member, deenergization of a solenoid permitting the associated member and operating lever to move by force exerted by the other member with the associated member in engagement with the relatively long lever arm.

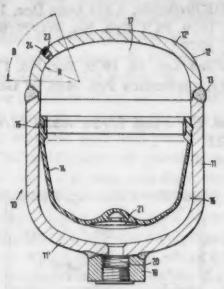
4,351,363

HYDRO-PNEUMATIC PRESSURE VESSEL

Gerhard Haug, Sachsenheim, and Heinz Siegel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1980, Ser. No. 130,091
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1979, 2911022
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **4 Claims**

1. A pressure vessel, comprising a housing having a chamber surrounded by external walls; a flexible partition subdividing said chamber into a gas compartment and a liquid compartment and being flexed within said housing under pressure of liquid medium contained in said liquid compartment, said liquid compartment having an opening to receive said liquid medium, said external walls including an upper wall being formed with curved lines of radii of different lengths; an inlet formed in said upper wall surrounding said gas compartment to receive a gas medium therein; and a locking element located in said inlet, said upper wall having an area formed with a graded



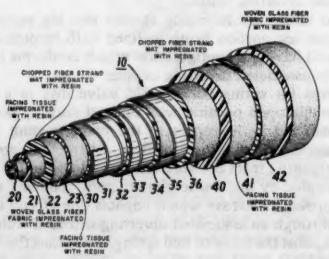
curve, said inlet being positioned in said area where said upper wall is formed with a curve of a minimum radius so that the gas medium filled in said gas compartment causes minimal deformations of said wall under gas pressure.

4,351,364

STEEL REINFORCED PIPE

Philip J. Cocks, Nuneaton, England, assignor to Dunlop Limited, England

Filed Nov. 5, 1979, Ser. No. 91,581
Int. Cl.³ F16L *11/08*
U.S. Cl. 138—133 **18 Claims**


WOVEN GLASS FIBER FABRIC IMPREGNATED WITH RESIN
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CHOPPED FIBER STRAND MAT IMPREGNATED WITH RESIN
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WOVEN GLASS FIBER FABRIC IMPREGNATED WITH RESIN
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1. A steel reinforced pipe comprising: an inner lining of tubular configuration comprised of distinct, successively wound layers of glass or other fibers impregnated with resin; a structural wall section of tubular configuration built up on said inner lining and comprised of at least three structural steel reinforcing strips each coated with a structural resin and each having a thickness between 0.25 mm and 0.75 mm, the structural steel reinforcing strips being helically wound in the form of helical convolutions one over the other about the longitudinal axis of the pipe with the convolutions of each strip being axially spaced from adjacent convolutions of that strip by the structural resin and being radially spaced from adjacent convolutions of the other strips by the structural resin; and an outer lining comprised of distinct, successively wound layers of glass or other fibers impregnated with resin built up on said structural wall section.

4,351,365
THERMALLY INSULATED TUBE

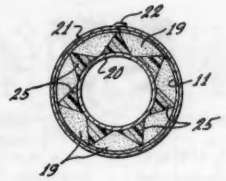
Klaus Bauermeister, Seelze; Gerhard Ziemek, Langenhagen, and Bernd Eilhardt, Hanover, all of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,997

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2836957

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—149 **5 Claims**



1. Thermally insulated conduit system, comprising an inner tube, an outer tube arranged concentrically to the inner tube, and a spacer construction disposed in the space between the inner and outer tubes, the improvement for the spacer construction comprising:

a high tensile strength ribbon, carrying outwardly tapering elements to define V-shaped notches between adjacent ones of the elements, the ribbon with elements being helically disposed in said space, the elements being made of a rigid foam of a polymer, the V-shaped notches being at least approximately aligned in axial direction to establish channels, the channels being also filled with foam.

4,351,366
HEAT-INSULATED CONDUIT

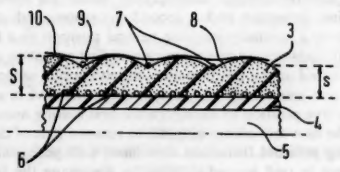
Attilio Angioletti, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Sep. 30, 1980, Ser. No. 192,558

Claims priority, application Italy, Oct. 24, 1979, 26735 A/79

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—149 **11 Claims**



1. A conduit for conveying a fluid under pressure comprising a tube having a wall substantially impervious to fluids for flow of the fluid through the conduit, a layer of closed cell distortable cellular polyurethene resin surrounding the tube and insulating the tube against temperature change of the fluid, and a strand wound about the resulting insulated tube compressing the cellular polyurethene resin between convolutions of the wire and said tube thereby forming an undulated radially outward surface on the said resin layer with longitudinally spaced rings of compressed cellular polyurethene resin and wavelike intermediate convolutions of cellular resin bulging radially outwardly from adjacent convolutions of the wire, and an air impervious polymeric sheath having substantially smooth radially outer and inner surfaces surrounding the cellular polyurethene layer with the said inner surface disposed against the peaks of said wave-like convolutions and spaced radially outwardly of said rings enclosing space between the rings and sheath, said space being filled with static inert gas.

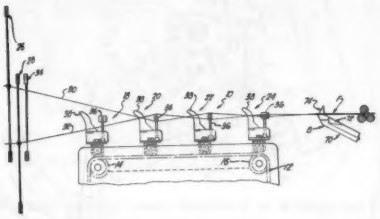
4,351,367
BEAT-UP SYSTEM

Thomas F. McGinley, Phillipsburg, N.J., assignor to McGinley Mills, Inc., Phillipsburg, N.J., a part interest

Filed May 13, 1980, Ser. No. 149,479

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—11 **28 Claims**



1. Apparatus for weaving employing warp threads and weft threads, comprising:

means for separating the warp threads into different planes to form warp sheds;

means for retaining said warp sheds;

means for moving said warp sheds and said shed-retaining means in the direction of said warp threads toward the fell of the fabric;

means for inserting weft thread through said moving warp sheds;

means for advancing said inserted weft threads to a beat-up position adjacent the fell of the fabric;

spacer means movable into and out of position between said warp threads for maintaining the spacing between said warp threads;

beat-up means cooperating with and movable relative to said spacer means, said beat-up means being movable into and out of position between said warp threads for beating up said weft threads from said beat-up position into the fell of the fabric and maintaining the spacing of said warp threads when said spacer means are withdrawn from said warp threads; and

said spacer means and said beat-up means being disposed on only one side of said warp threads.

4,351,368
DOBBY

Joseph Palau, Duingt, France, assignor to S.A. des Etablissements Staubli, Fauerges, France

Filed May 28, 1980, Ser. No. 153,794

Claims priority, application France, Jun. 22, 1979, 79 16669

Int. Cl.³ D03D *51/00*

U.S. Cl. 139—324 **3 Claims**

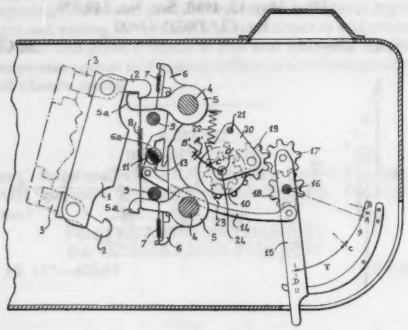
1. An improved reading device for a loom dobby having a housing containing double swinging levers, and having hooks pivotable about fixed pivot bars, and having rotating pattern discs with pegs extending therefrom to contact adjacent elements of the hooks and displace the contacted hooks into engagement with the pivot bars, and having a drive shaft for driving the pattern discs, the improvements comprising:

actuating lever means supporting said discs for rotation about a support shaft, the lever means being carried by the dobby housing and moveable to move the discs and supporting shafts between operative positions wherein the pegs engage the hook elements, and retracted inoperative positions;

a transverse cam member rotatably mounted in the housing

and extending across the hook elements parallel to their pivot bars;

heel members mounted on some of the hook elements and extending toward the cam member, the cam member being pivotable between a position in which it engages the heel members and displaces the associated hooks to engage the pivot bars, and inoperative positions out of engagement with the heel members; and



arm and connecting rod means connected to rotate the cam member and to displace the actuating lever means between selectible different arm positions in which the cam member and discs are both in inoperative positions, in which the lever means moves the discs into said operative position and the cam member into an inoperative position, and in which the cam member is in heel-member engaging position and the lever means and discs are in inoperative position.

4,351,369

FLUID SUPPLY APPARATUS IN SHUTTLELESS LOOM

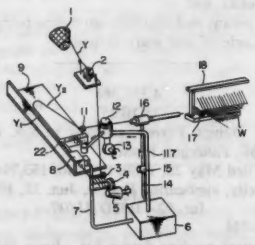
Hiroshi Arakawa, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 5, 1979, Ser. No. 100,288

Claims priority, application Japan, Dec. 12, 1978, 53/15417; Dec. 12, 1978, 53/15418; Dec. 12, 1978, 53/171681[U]

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **16 Claims**



1. A fluid supply apparatus in a shuttleless loom provided with a gripper which repeats the gripping and releasing of a weft in synchronism with the weft inserting operation, comprising a compressed fluid source, a valve mechanism having a fluid entrance and at least one fluid discharge exit, said gripper having a movable member which forms a part of said valve mechanism, a pipe means connecting said compressed fluid source to said fluid entrance of the valve mechanism, at least one nozzle disposed at a position apart from said gripper in the loom, a connecting means connecting said nozzle to said fluid discharge exit, and actuating means for actuating said valve mechanism in synchronism with the gripping and releasing operation of the gripper.

4,351,370

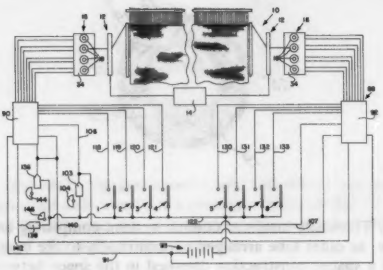
YARN BRAKE FOR A TEXTILE MACHINE

David A. Guy, Matthews, and Philip A. Nims, Charlotte, both of N.C., assignors to Crompton & Knowles Corporation, New York, N.Y.

Filed May 5, 1980, Ser. No. 146,879

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—450 **16 Claims**



1. A weft yarn braking system in a loom having means for selectively inserting a plurality of diverse yarns from each side of the loom, said loom having a pattern mechanism, weft yarn inserting mechanism, weft yarn selecting and presenting mechanism at each side of the loom and operatively connected to the pattern mechanism for presenting a selected weft yarn to the weft yarn inserting mechanism, said weft yarn braking system comprising:

(a) a brake for each weft yarn at each side of the loom, each brake comprising:

(1) a stationary clamping plate;

(2) a movable clamping plate mounted for movement toward and away from the stationary clamping plate, wherein the weft yarn associated with said brake extends between said plates;

(3) first biasing means for biasing the movable clamping plate against the stationary clamping plate;

(4) second biasing means for biasing the movable clamping plate against the stationary clamping plate;

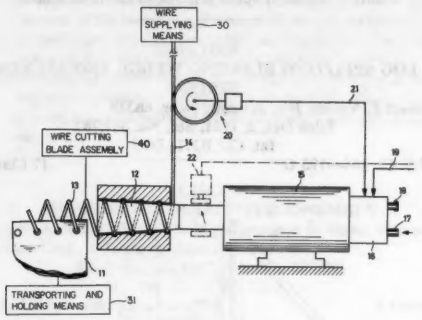
(5) electro-magnetic disengaging means for receiving a first actuation and a second actuation, and operable from a normally inactive neutral position to a first active position upon receiving said first actuation and to a second active position upon receiving said second actuation, said disengaging means being effective in said first active position to disengage the first biasing means from the movable clamping plate to remove part of the braking pressure from said associated weft yarn, and effective in said second position to disengage the first and second biasing means to remove all braking pressure from said associated weft yarn;

(b) control means operatively connected to each brake and operating in timed relation to the loom for providing a second actuation to the electro-magnetic disengaging means of the brake associated with the selected weft yarn for disengaging the first and second biasing means of said associated brake during the initial major portion of the insertion of said selected weft yarn, and for providing a first actuation to the electro-magnetic disengaging means of said associated brake during the latter minor portion of the insertion of said selected weft yarn, whereby all braking pressure is removed from said selected weft yarn during said major portion and a portion of the braking pressure is removed from said selected weft yarn during said minor portion.

4,351,371
APPARATUS FOR PRODUCING COILS

Friedrich Mann, Nuertingen, and Guido Negro, Neuffen, both of Fed. Rep. of Germany, assignors to Bielomatik Leuze GmbH + Co., Fed. Rep. of Germany

Continuation of Ser. No. 69,457, Aug. 24, 1979, abandoned. This application May 4, 1981, Ser. No. 260,310
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837918
Int. Cl.³ B21F 3/02
U.S. Cl. 140—92.3 6 Claims



1. An improved apparatus for the production of wire coils for binding packs of sheets, the apparatus having a winding spindle for forming the coils, means for supplying the wire to the winding spindle, means for metering lengths of the wire, a pneumatic motor having a shaft for intermittently driving the winding spindle, means for transporting perforated packs of sheets to and from a position operationally adjacent the winding spindle, and means for holding the perforated packs of sheets in the operationally adjacent position during insertion of the wire coil, wherein the improvement comprises:

means for stopping the pneumatic motor in response to the metering means; and,

a direct connection between the driving shaft and the winding spindle, without any intervening transmission or switch coupling, notwithstanding the intermittent operation, whereby a resulting low momentum drive arrangement takes advantage of elastic properties of the wire to provide a small angle through which the motor can begin rotating without experiencing the full load due to bending and transporting the wire, and the pneumatic motor is braked by the load due to mechanical resistance of the winding spindle after the motor is stopped.

4,351,372
LIQUIFIED GAS PUMPING AND CYLINDER RE-FILL SYSTEM

Manuel O. Delgado, Jr., 1618 King Dr., New Orleans, La. 70122

Filed Oct. 11, 1979, Ser. No. 83,825
Int. Cl.³ B65B 3/04
U.S. Cl. 141—2 8 Claims

1. A pumping system for filling relatively high pressure, liquified gas cylinders with a liquified gas, comprising:

a low pressure, enclosed source tank of liquified gas;

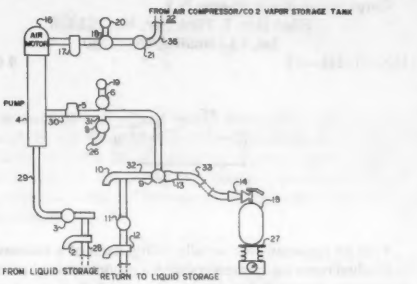
reciprocally driven, plunger-type pumping means for generating sufficient hydraulic pressure on the liquified gas from said tank source at the pressures required to rapidly fill high pressure cylinders;

pneumatic drive means connected to the plunger of said pumping means for reciprocally driving said pumping means;

source line means connecting said source and said pumping means together to supply liquified gas to said pump means;

cylinder connect means for connecting the cylinder to be filled to said pumping means; and

cylinder line means connecting said connect means and said pumping means together to supply liquid gas under high pressure to said cylinder connect means and to any cylinder connected thereto;



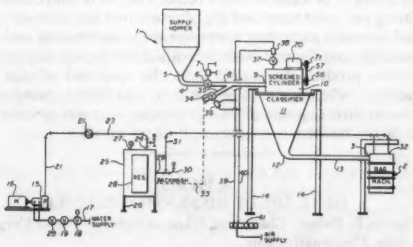
multi-way valving means connected to at least one of said cylinder line means and said cylinder connect means; and

return line means connecting said multi-way valving means and the source tank directly together for returning the liquified gas to the source tank when a cylinder is not being filled.

4,351,373
SYSTEM OF APPARATUS FOR FILLING BAGS WITH DRY POWDER

Emmanuel Mechalas, 2830 Townway, Danville, Ill. 61832

Filed Jun. 9, 1980, Ser. No. 157,350
Int. Cl.³ B65B 1/16, 31/02; B01F 7/04
U.S. Cl. 141—51 18 Claims



1. A system of apparatus for filling bags with dry powdered material and separating foreign matter therefrom comprising

an air tight enclosure for receiving a bag for filling with a dry powder,

vacuum producing means connected to said enclosure for evacuating the same,

means for storing and supplying a dry powder to said enclosure,

a classifier operatively connected to said storage means to receive powder therefrom and operatively connected to said enclosure to supply powder thereto with foreign matter separated therefrom,

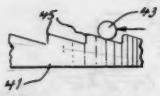
said classifier, comprising a screen separator positioned to receive said dry powder and separate foreign matter of a size greater than the powder,

means connecting said vacuum producing means to said classifier to maintain the same under vacuum during operation, and

means connecting said vacuum producing means to said classifier in a reversed relation and operable to backflush

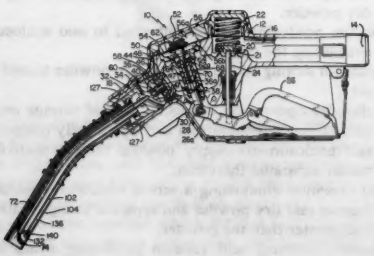
said screen separator to remove particulate matter collected thereon.

4,351,374
POUCH FILLING MACHINE
C. G. Peter Oldershaw, Avon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Dec. 5, 1980, Ser. No. 213,430
Int. Cl.³ B65B *1/08, 43/60*
U.S. Cl. 141—71 **9 Claims**



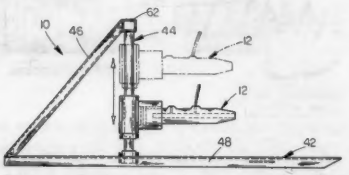
1. In an apparatus for serially filling each of a succession of individual open top containers with a predetermined amount of particulate material flowable under the influence of gravity and dischargeable from a bulk supply thereof in a free flowing stream at a uniform predetermined rate of flow, said apparatus including a continuously rotating turret member having means for supporting said containers through a predetermined arc of rotation, a turntable mounted above said turret member and rotatable in unison therewith, said turntable including material distributing means arranged circumferentially thereon and disposed to intercept said stream during rotation of said turret for separation and collection thereof individually in said predetermined amounts, said material distributing means including open-ended tray members mounted for tilting motion when traversing said predetermined arc of rotation for individually collecting said predetermined amounts of material, said trays when tilted discharging said predetermined amounts of material into a respective one of said container, cam means operable for controlling the gradual discharge of said collected individual amounts of material into a respective one of said containers during said predetermined arc of rotation of said turntable, and said turntable including a member disposed beneath said tray members and formed with individual fill funnels disposed to receive product discharged from the open-end of said tray members when in the tilted position, said funnels being effective for directing said discharge product into a respective one of said containers carried by said turret member.

4,351,375
DUAL SPOUT DISPENSING NOZZLE
Charles L. Polson, Cincinnati, Ohio, assignor to Dover Corporation, Cincinnati, Ohio
Filed May 27, 1980, Ser. No. 153,884
Int. Cl.³ B65B *3/18*
U.S. Cl. 141—98 **21 Claims**



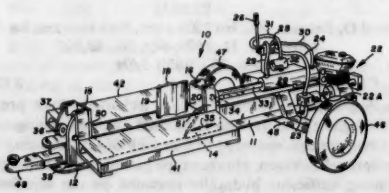
1. A dispensing nozzle, comprising:
(a) a nozzle body having an inlet and an outlet with a flow passage therebetween;
(b) an adapter securely fitted in the outlet of the nozzle body;
(c) a pair of rigid concentric spouts extending from the nozzle body outlet including an inner spout disposed with an outer spout, an end portion of the inner spout being sealingly received by the adapter for selective fluid communication with the nozzle body inlet;
(d) a locating element attached to both the adapter and the outer spout, the locating element being operative to prevent relative rotational movement between the outer spout and the adapter; and
(e) retaining means releasably secured to the nozzle body for securing the outer spout relative to the nozzle body.

4,351,376
LOG SPLITTING BLASTING WEDGE AND ANCHOR SYSTEM
Albert F. Vosika, Rte. 2, Crete, Nebr. 68333
Filed Oct. 2, 1981, Ser. No. 307,782
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 G **17 Claims**



1. A log blasting wedge, including
an elongated body having a forwardly tapered forward end portion, a middle portion and a rearward end portion,
said forward and middle portions having an axial bore therethrough, said bore having an open forward end and a closed rearward end terminating at the rearward end of said middle portion,
a first wick hole through said middle portion in communication with said bore, said first wick hole being positioned in longitudinally spaced relation from said forward and rearward portions, and
a second wick hole through one of said forward and middle portions in communication with said bore, said second wick hole being spaced longitudinally forwardly of said first wick hole.

4,351,377
LOG SPLITTER
Daniel L. Hamel, 3250 Twin Lake Rd., St. Paul, Minn. 55110
Filed Dec. 8, 1980, Ser. No. 214,342
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 A **2 Claims**



1. A log splitter comprising, in combination:
(a) a frame including an elongated flanged rail;
(b) an elongated bed reciprocable along said rail through a range of travel and having pusher faces at its ends extending away from said rail and spaced by a distance greater than the travel of said bed on said rail, said bed including

roller means carried at the ends thereof, for engaging the top of said rail to support said bed thereon, and guide means extending the full length of said bed for cooperating with the flanges of said rail to limit the motion of the bed to travel longitudinal of the rail;

(c) a pair of log support cradles removably carried by the ends of said bed and extending therebetween, said cradles projecting laterally beyond said rail on opposite sides thereof;

(d) a double edged splitting wedge removably secured to said rail between said pusher faces of said bed, the length of said bed between said pusher faces being no less than the sum of the longitudinal dimension of said wedge added to the length of a log to be split, and the travel of said bed being no less than the length of a log to be split; and

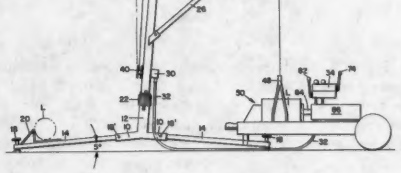
(e) reversable power means connected to said rail and said bed and operable to apply force to said bed along a line passing longitudinally through said wedge and said pusher faces.

4,351,378

HYDRAULIC LOGSPLITTER ASSEMBLY

Harvey A. Smith, Hampden, Mass., assignor to Sigma Development Corp., Hampden, Mass.

Filed Jan. 23, 1981, Ser. No. 227,805
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 A **6 Claims**



1. A hydraulic logsplitter assembly including a log splitting mechanism and comprising means for transporting and delivering logs thereto consisting of:

a horizontally-swingable boom,

a support mechanism supporting the boom upwardly and disposed at an angle from the vertical centerline for facilitating the free swinging of the boom at an angle on an inclined plane under the weight of a load between charging and discharging positions,

a base for rotatively supporting the support mechanism,

a torsion spring interconnecting the base and support mechanism for the swinging returnably of the boom from discharging to charging position,

a cable supported by the boom, and

a grapple unit mounted at the free end of the cable.

4,351,379

METHOD OF REELING AND UNREELING A REINFORCED VENEER SHEET

Katsuji Hasegawa, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan

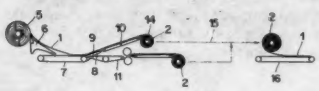
Filed Dec. 22, 1980, Ser. No. 218,828
Claims priority, application Japan, Dec. 28, 1980, 54-172310
Int. Cl.³ B27D *1/00, 5/00*
U.S. Cl. 144—365 **4 Claims**

1. A method of reeling and unreeling a reinforced veneer sheet comprising the steps of

(1) forming at least one elongated cut in a selected one of two sides of a veneer sheet across its grain;

(2) embedding a length of cord in said elongated cut to reinforce the veneer sheet;

(3) winding said reinforced veneer sheet onto a reel having an axis such that said cut side faces radially outward relative to the axis of the reel; and



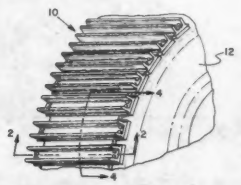
(4) unwinding said wound veneer sheet off the reel such that said cut side faces downward relative to the surface of the earth, whereby said length of cord acts to tightly hold the sheet on the reel during the step (3) and maintain its engagement in the cut by supporting the veneer from below during the step (4).

4,351,380

TRACK BELT ASSEMBLY

Charles J. Pilliod, Jr., Akron, Ohio, and Roger E. Payne, Okemos, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 29, 1980, Ser. No. 221,147
Int. Cl.³ B60C *27/06, 9/00*; B62D *55/24*
U.S. Cl. 152—169 **13 Claims**



1. An endless track belt assembly comprising:

an endless reinforcing belt structure having a pair of lateral edges;

a plurality of shoes spaced about the outer periphery of said reinforcing belt structure, each of said shoes having a pair of end portions which extend, respectively, beyond said pair of lateral edges of said reinforcing belt structures;

characterized by means securing said belt structure to said shoes including a plurality of circumferentially adjacent pairs of anchor plates, said anchor plates of each of said pair extending in spaced apart, end to end, generally coplanar relationship to each other and generally parallel superposition with one of said shoes;

a portion of said belt structure being disposed between said anchor plates and said shoes, each anchor plate having an inner end spaced from the inner end of the other anchor plate of said pair and an outer end secured to the outer end portion of said one of said shoes, the space formed between said anchor plates of each pair is such that said space is not circumferentially adjacent the space formed between the anchor plates of the circumferentially adjacent pair.

6. An endless track belt assembly comprising:

an endless reinforcing belt structure having a pair of lateral edges;

a plurality of shoes spaced about the outer periphery of said reinforcing belt structure, each of said shoes having a pair of end portions which extend, respectively, beyond said pair of lateral edges of said reinforcing belt structures;

characterized by means securing said belt structure to said shoes including a plurality of circumferentially adjacent pairs of anchor plates, said anchor plates of each of said pair extending in spaced apart, end to end, generally co-

planar relationship to each other and generally parallel superposition with one of said shoes;

a portion of said belt structure being disposed between said anchor plates and said shoes, each anchor plate having an inner end spaced from the inner end of the other anchor plate of said pair and an outer end secured to the outer end portion of said one of said shoes, said anchor plates of each of said pair are spaced apart and extend axially beneath the reinforcing belt structure such that they are coextensive to each other for at least a portion of their axial length.

4,351,381

TREAD FOR PNEUMATIC TIRE

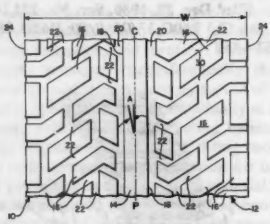
Charles W. Roberts, Akron; Daniel J. Lindner, Canal Fulton, both of Ohio; Henry T. Kwee, Luxembourg, Luxembourg; Michael A. Kolowski, Mogadore, Ohio, and Harold D. Fetty, Birmingham, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 877,788, Feb. 14, 1978, abandoned. This application Nov. 12, 1980, Ser. No. 206,202

The portion of the term of this patent subsequent to Jan. 22, 1994, has been disclaimed.

Int. Cl.³ B60C *11/04*

U.S. Cl. 152—209 R **1 Claim**



1. A pneumatic passenger tire having a carcass structure, a ground-engaging tread portion disposed circumferentially about said carcass structure, a pair of annular bead portions, one at each of the radial inner ends of said carcass structure, said tire characterized in that the tread portion comprises:

a continuous circumferentially extending rib located substantially in the central portion of said tread portion, the overall circumferential direction of the axial sides of said rib form an angle with respect to the midcircumferential plane of tire no greater than about 10°;

a plurality of independent projections placed circumferentially about the remaining portion of said tread portion so as to provide two continuous circumferentially extending grooves one on each side of said rib and a plurality of laterally extending grooves which extend from each of said circumferentially extending grooves toward the closest respective tread edge of said tire in a substantially uninterrupted manner, said laterally extending grooves and said pair of circumferentially extending grooves having no jogs which are greater than the width of said laterally extending grooves, said tread portion having no other substantially circumferentially extending grooves, said lateral grooves follow a substantially transverse path from said central groove axially outward toward a first point spaced from the midcircumferential plane of said tire a distance of approximately 10% to 20% of the width of said tread and then follows a path from said first point to a second point so that such lateral grooves form an angle of at least 50° with respect to the midcircumferential centerplane of said tire between said first and second points, said second point being spaced from said tread edge a distance of about 15% to 20% of said width of said tread, said lateral grooves follow a path from said second point axially outward to said tread edge in a substantially transverse direction, said central rib is provided with a plurality of sipes or notches, said sipes or notches extend axially across the width of said rib a distance not greater than 50% of the axial width of said rib, the depth of said sipes are not less than 25% of the depth of the grooves in between said projection, wherein said independent projections adjacent said central groove and adjacent said tread edge having a circumferential length such that said adjacent projections alternate in circumferential length in the ratio of about two to one, the net to gross of said tread is less than 65 percent.

4,351,382

TIRE AND WHEEL RIM ASSEMBLIES

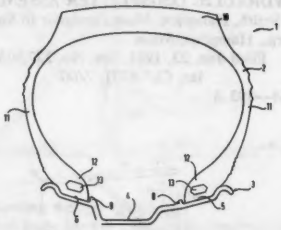
Michael R. Corner, Coventry; Ian Kemp, Tamworth, and Tom French, Sutton Coldfield, all of England, assignors to Dunlop Limited, London, England

Filed Dec. 2, 1980, Ser. No. 212,143

Claims priority, application United Kingdom, Dec. 6, 1979, 7942181

Int. Cl.³ B60C *5/16, 15/02*

U.S. Cl. 152—330 RF **37 Claims**



1. A tire and wheel rim assembly comprising a tire having a tread portion connected at each edge to a respective one of a pair of sidewalls each terminating at its radially inner edge in an annular tire bead, each tire bead having a substantially inextensible bead reinforcement and a one-piece wheel rim having a tire fitting well between a pair of axially spaced bead seats on each of which a respective one of said tire beads is seated, each bead seat being tapered at an angle of about 5° in an axially and radially outwards direction with respect to the rotational axis of said rim and terminating at its radially outer edge in a respective tire bead retaining flange, one of said bead seats being substantially straight and having adjacent to the axially inner edge thereof an abutment extending circumferentially around said bead seat, said abutment being substantially continuous and having a height of at least 2.2 mm and a maximum diameter not greater than the minimum diameter of said bead reinforcement to allow fitment of said tire by passage of the associated tire bead outwards over said abutment and a generally radially extending axially outwardly directed abutment face to engage the toe of said associated tire bead, said abutment face having a maximum radial dimension with respect to the width and the taper angle of the adjacent bead seat such that under the action of road generated forces rotation of said tire bead about said abutment is effected to retain said tire bead at said bead seat.

35. A one piece wheel rim comprising a tire fitting well between a pair of axially spaced annular bead seats, each bead seat being tapered in an axially and radially outwards direction with respect to the rotational axis of said rim and terminating at its axially outer edge in a respective tire bead retaining flange, one of said bead seats being substantially straight and having adjacent to the axially inner edge thereof an abutment extending circumferentially around said bead seat, said abutment being substantially continuous and having a height of at least 2.2 mm and a maximum diameter such that a tire bead of a tire for which the rim is intended can pass over said abutment to seat on said adjacent bead seat and a generally radially

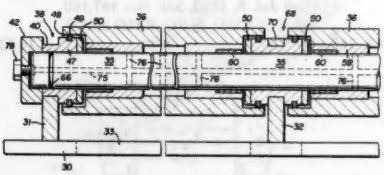
extending and axially outwardly directed abutment face to engage the toe of a tire bead seated on said adjacent bead seat so that under the action of road generated side forces rotation of said tire bead about said abutment is effected to retain the tire bead at said bead seat.

4,351,383

BEARINGS FOR CONTINUOUS CASTING ROLLER APRONS

Floyd R. Gladwin, deceased, late of Grosse Ile, Mich. (by Yvonne J. Gladwin, executrix), assignor to Gladwin Corporation, Taylor, Mich.

Filed Apr. 10, 1980, Ser. No. 138,850
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—448 **8 Claims**



1. In a roller apron for supporting and guiding a metal strand formed in a continuous casting mold through a cooling system such as a water spray or the like, said roller apron having spaced apart rails with elongated rollers extending between the rails and with the rollers each formed of a center shaft and with means fixedly mounting the shaft upon the rails, and a surrounding cylindrically shaped roller sleeve rotatably fitted around the shaft and having its inner circular wall spaced from the outer surface of the shaft, an improved bearing construction comprising:

a journal type bearing arranged between the shaft and roller sleeve and formed of an elongated, thin-wall, generally cylindrically shaped bearing sleeve surrounding the shaft and said bearing sleeve having an axial length, the entire outer surface along the axial length of said bearing sleeve being tightly in surface to surface contact with the inner wall of the roller sleeve so as to form a non-slip, frictional engagement with the roller sleeve and roughly one-half of the axial length of the inner surface of said bearing sleeve forming a rotatable contact with the shaft;

an annular, cylindrically shaped recess of substantial width formed along roughly one-half of the axial length of said bearing sleeve in the inner surface of the bearing sleeve and a thin-wall, cylindrically shaped liner bushing being tightly and non-rotatably fitted within and along substantially the full width of the recess, and the inner surface wall of the bushing rotatably engaging the shaft and forming a part of the shaft engaging wall surface of the bearing;

and said bearing sleeve being formed of a bronze-like bearing type material of relatively substantial compressive strength, and with the liner bushing being formed of a lower coefficient of friction, but lower compressive strength material;

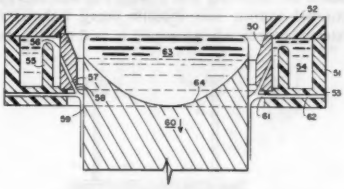
said sleeve and said liner bushing together providing a reduced friction surface for said roller shaft than would be provided by a bronze-like sleeve, and yet providing greater resistance to compression forces transmitted by said shaft, in response to the temperature and ferrostatic pressures of said strand and said cooling system, than would be provided by a lower compressive strength material bushing.

4,351,384

COOLANT CONTROL IN EM CASTING

David G. Goodrich, Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 24, 1979, Ser. No. 78,338
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—468 **1 Claim**



1. In the method of continuous or semicontinuous casting of light metal products wherein molten metal is introduced into the feed end of an annular electromagnetic inductor, wherein the shape of the molten metal is controlled as it solidifies or partially solidifies in the inductor by means of forces generatexd by an electromagnetic field and wherein coolant is applied to the surface of the solidified or partially solidified metal which emerges from the discharge end of said electromagnetic inductor, the improvement comprising:

(a) directing a first stream of liquid coolant around the periphery of the emerging metal at an angle of about 5° to 40° from the inductor axis and in the direction away from the discharge end of the electromagnetic inductor;

(b) directing a second stream of fluid around the periphery of the emerging metal at an angle between about 20° and 95° from the first stream so that both first and second streams converge to form a confluent stream at a position disposed a short distance away from the emerging metal surface and the confluent stream then contacts the metal surface at a desired location depending upon the volume and velocity of the two streams, with the sum of the angle between the first stream and the inductor axis and the angle between the first and the second stream not exceeding 125°; and

(c) controlling the volume or velocity or both the volume and velocity of the second fluid stream at elevated levels at the start of casting in order to direct the confluent coolant stream to an impact area on the emerging metal which is as close as possible to the discharge end of the electromagnetic inductor and when the butt of the ingot or billet passes the area of coolant impact, decreasing the volume or velocity or both the volume and velocity of the second fluid stream so that the area of coolant impact on the ingot or billet is moved farther away from the discharge end of the inductor than at the start of casting.

4,351,385

TEMPERATURE CONTROL SYSTEM FOR CHROMATOGRAPHS

Guy C. Amey, Arkansas City, Kans., assignor to The Foxboro Company, Foxboro, Mass.

Filed May 16, 1980, Ser. No. 150,534
Int. Cl.³ F25B *29/00*; G01N *31/08*
U.S. Cl. 165—61 **9 Claims**

1. A field-operable, portable chromatographic instrument, comprising, in combination,

a container with a removable cover to permit ready access to the interior thereof;

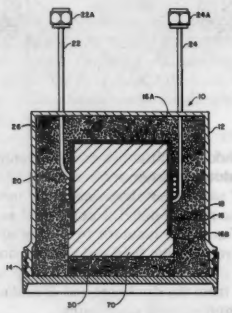
wall means within said container defining an interior cavity having an insert opening at one end thereof, said wall means being capable of high rates of heat transfer;

a chromatographic column wound around said wall means and being in direct heat transfer relationship therewith;

heat insulation means surrounding said column to substan-

tially minimize outward heat transfer away from said container;

a temperature-control module adapted to be inserted within said interior cavity, the shape of said module matching that of said cavity such that when inserted therein said module is in direct heat transfer relationship with said wall means and hencewith said column, said module including means for receiving and storing thermal energy from an external source, said module being isolated from said external source when inserted in said cavity, said module



further including means for transferring stored thermal energy received from said external source between said storing means and said column so as to maintain the temperature of said column at a predetermined value for a period of time long enough to permit chromatographic analysis independent of the transfer to said storing means of more thermal energy from said external source, whereby;

said module is a self-contained source of energy for providing effective temperature control over said column.

4,351,386

INTERNALLY COOLED ROLLER BODY CONSTRUCTION

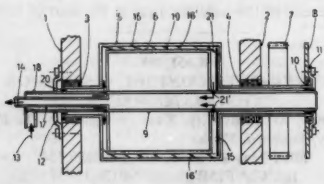
Ingo Köbler, Gessertshausen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,231

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927198

Int. Cl.³ F28F *5/02*

U.S. Cl. 165—89 **10 Claims**



1. Cooling roller comprising:

an outer rotatable cylindrical jacket (**5**);

a stationary concentrically positioned body (**6**) located therein and forming a stationary fluid displacement body, said body being of smaller diameter than the diameter of the jacket (**5**) to define a cooling fluid chamber (**19**) between the rotatable jacket and the stationary body;

spiral surface deformations (**16**) formed on the inner surface of the outer jacket (**5**) facing the cooling fluid chamber to provide an axial cooling fluid transport spiral;

a stationary hollow shaft (**9**);

means (**10, 20**) rotatably supporting the outer cylindrical jacket (**5**) on said stationary hollow shaft;

a supply pipe (**18**) surrounding the hollow shaft, with clearance, to define a supply duct (**17**) between the supply pipe and the hollow shaft;

means communicating the supply duct (**17**) with the chamber (**19**) at one axial end thereof and for subsequent fluid transport, in axial direction by said transport spiral;

a quieting, or settling chamber (**21**) located at the other axial end of the cooling fluid chamber (**19**) to reduce turbulence of fluid received from said cooling chamber;

and means (**21'**) conducting cooling fluid from said quieting or settling chamber to the interior of the hollow shaft (**9**) for removal therefrom.

4,351,387

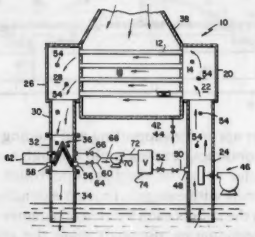
SIEVE ASSEMBLY FOR CLEANING BODIES AND HEAT EXCHANGER SYSTEM INCLUDING SAME

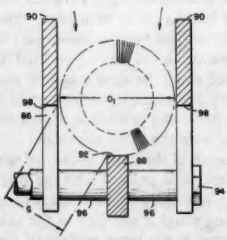
Louis Milia, 16 Ellen Pl., Kings Park, N.Y. 11754

Filed Jul. 8, 1980, Ser. No. 167,160

Int. Cl.³ F28G *13/00*; B01D *35/02*

U.S. Cl. 165—95 **14 Claims**





1. In an apparatus having tubes in which the internal surface is subjected to the build-up of a deleterious scale formation, an assembly for effecting the removal of such scale from said internal surface of said tubes which comprises: a source of fluid, conduit means for passing said fluid through said tubes, means for introducing a plurality of cleaning bodies having a predetermined diameter into said fluid prior to passage through said tubes conduit means for receiving said fluid after passage through said tubes, sieve means for separating said cleaning bodies from said fluid after passage through said tubes, and means for collecting and recycling said cleaning bodies to said conduit means, an improved sieve assembly for said sieve means comprising:

a plurality of guide rails having a top wall, a bottom wall and side walls, said side walls being spaced a distance at least equal to said diameter of said cleaning bodies;

support bars including a top wall and bottom wall disposed between respective guide rails, said top wall of said guide rail extending above said top wall of said support rail a

distance of at least one-half of said diameter of said cleaning bodies and said bottom wall of said guide rail being spaced from said top wall of said support rail of less than one-half of said superficial diameter of said cleaning bodies; and

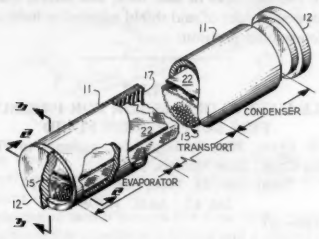
means for mounting in relative juxtaposition said guide rails and said support bars.

4,351,388

INVERTED MENISCUS HEAT PIPE

Leslie D. Calhoun, Creve Coeur, and Marion E. Peeples, Florissant, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 13, 1980, Ser. No. 159,220
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.26 **17 Claims**



1. A heat pipe having evaporator, transport, and condenser portions comprising:

an enclosure envelope having an axial passage with circumferential grooves therein;

at least one composite wick having a capillary core means with a porous sheath, having a pore size smaller than that of said core means, surrounding and in intimate, continuous contact with said core where said sheath contacts said grooves, axially oriented in said passage and having a cross sectional area less than the cross sectional area of said passage so as to provide at least one axial vapor channel adjacent said composite wick which has at least one axial access path to said circumferential grooves;

means to retain said composite wick having a capillary core means and a porous sheath in intimate contact with said circumferential grooves in said passage; and

a working fluid in said enclosure which wets said circumferential grooves and has sufficient surface tension so as to insure a static capillary rise in said composite wick so as to saturate said wick at least in said evaporator portion of said heat pipe so that as heat is applied to said heat pipe, said working fluid is vaporized at the outside diameter of said circumferential grooves and trapped between the meniscus of said working fluid as it emerges from said pores in said sheath by capillary action maintaining said meniscus in a concave or inverse shape since the working fluid adheres to the minor diameter of said circumferential grooves, whereby a very thin liquid film is maintained where the heat transfer takes place as said vapor cannot escape until it reaches said axial access path.

4,351,389

HEAT EXCHANGER APPARATUS

Stephen Guarnaschelli, 4608 Wayfarer Pl., Orlando, Fla. 32807

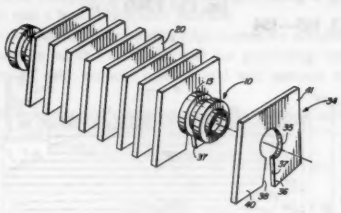
Filed Jul. 27, 1981, Ser. No. 287,376
Int. Cl.³ F28F *1/42*
U.S. Cl. 165—141 **10 Claims**

1. A heat exchanger comprising in combination:

a center pipe;

a coaxially mounted outer pipe mounted over said center pipe and have spiralling grooves formed therein against said center pipe;

heat exchanger fins formed in said outer pipe grooves to thereby transfer heat from said center and outer pipes; and



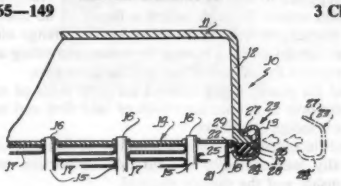
said heat exchanger fins being shaped to have an opening therethrough and a split from each opening to one edge thereof, one side of said split being bent whereby said fins can be threaded onto said outer pipe grooves.

4,351,390

RETAINING CLIPS FOR GASKETED TANKS ON HEAT EXCHANGERS

Charles S. Argyle, Willowdale, and Ralph G. Nanos, Toronto, both of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 11, 1980, Ser. No. 120,433
Int. Cl.³ F28D *1/00*
U.S. Cl. 165—149 **3 Claims**

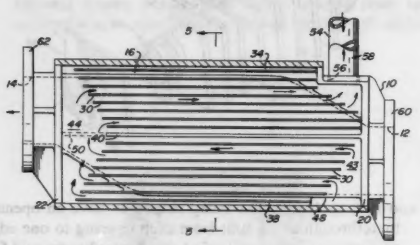


1. A retaining clip for use in securing a tank and a header plate of a heat exchanger together in a fluid tight relationship, the tank and the header plate each having a peripheral flange receiving a resilient sealing gasket therebetween, the header plate flange having a depending portion and an outwardly and upwardly inclined portion defining a channel receiving said gasket, the retaining clip comprising a base portion joining a pair of oppositely disposed substantially parallel walls completely formed prior to assembly, said one wall extending behind the depending flange portion of said header plate flange, and the opposite wall being positioned beyond said peripheral flanges and terminating in an inwardly inclined flange engaging the tank flange to compress the sealing gasket, the inclined clip flange initially contacting said tank flange and the clip is rotated to snap under said header plate flange.

4,351,391
HEAT EXCHANGER FOR WATER PUMPING SYSTEM

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed May 19, 1980, Ser. No. 151,278
Int. Cl.³ F28D 7/10
U.S. Cl. 165—154 6 Claims



1. A heat exchanger comprising:

an elongated body having an inlet opening at one end thereof and a discharge opening at the other end thereof,

said body including a tubular portion extending between said inlet and discharge openings for defining a first heat exchange chamber internally thereof,

a cover means spaced apart from and enclosing the exterior of said tubular portion to cooperate therewith to define a second heat exchange chamber,

inlet means through which a liquid to be cooled may be supplied to said second heat exchange chamber, and

outlet means through which a liquid to be cooled may be discharged from said second heat exchange chamber,

said tubular portion having fin means providing an extended surface for effective heat exchange action,

said fin means being located on both sides of said tubular portion to extend into both of said first and second heat exchange chambers,

said fin means including a plurality of fins extending generally longitudinally of said tubular portion on both the inside and the outside thereof,

said outside fins cooperating with said cover and said tubular portion to define a plurality of longitudinally extending conduits in said second heat exchange chamber through which the liquid to be cooled flows as it passes through said heat exchanger,

said tubular portion being provided with divider wall portions for dividing said second heat exchange chamber into a plurality of flow compartments extending longitudinally of said tubular portion and crossover ports providing flow communication between adjacent flow compartments, said crossover ports being located so that the liquid to be cooled flows in opposite directions in adjacent ones of said flow compartments,

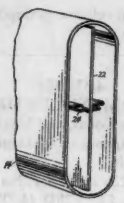
said divider wall portions dividing said second heat exchange chamber into four flow compartments, there being three crossover ports arranged at the ends of said flow compartments so that said liquid to be cooled makes four passes longitudinally back and forth along said tubular portion.

4,351,392
HEAT EXCHANGE TUBE WITH HEAT ABSORPTIVE SHIELD

Richard F. Stockman, Friendship, N.Y., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1980, Ser. No. 218,895
Int. Cl.³ F28F 1/40
U.S. Cl. 165—186 2 Claims

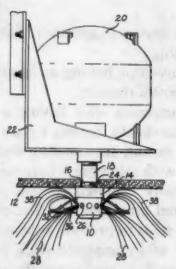
1. A recuperative heat exchanger that directs a fluid to be heated in heat exchange relation with a heating fluid, said heat exchanger including tube means having essentially flat sidewalls with inlet and outlet ends adapted to conduct a fluid to be heated through said tube means, means for directing a heating fluid over the outside of the tube to heat said tube by contact therewith, heat absorptive shield means positional longitudinally in said tube means between sides thereof lying essentially parallel to the flat sides of said tube, and lateral spacers confronting opposite sides of said shield adapted to hold said shield in a predetermined position.



4,351,393
NOZZLE HAVING DEFLECTOR FOR PRESSURIZED FIRE SUPPRESSION FLUID

Charles N. Tyree, Blue Springs, Mo., assignor to Fike Metal Products Corp., Blue Springs, Mo.

Filed Nov. 24, 1980, Ser. No. 209,714
Int. Cl.³ A62C 37/08
U.S. Cl. 169—37 9 Claims



1. In a fire sprinkling system for delivering a fire suppressing fluid initially in liquified form from a fluid pressure tank in response to temperature-sensing means,

a tubular spray nozzle for placement into communication with said tank and disposition adjacent a ceiling in depending relationship thereto,

said nozzle having a number of circumferentially spaced, fluid discharge orifices therearound for converting the pressure existing in said fluid into velocity and throttling the fluid discharged therefrom into small streams radiating from the nozzle; and

a device for protecting the ceiling against damage which would otherwise result from the force of said streams jetting thereagainst,

said device including a hollow shield attached to and surrounding the nozzle between the ceiling and said orifices,

said shield being provided with a lower, fluid impinging surface within the path of said streams and spaced outwardly of said orifices,

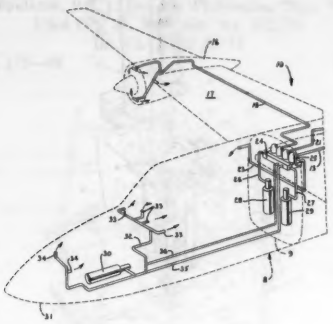
said surface being shaped and disposed to deflect a portion of the fluid flow downwardly away from the ceiling, there being a lowermost continuous, annular, planar, outwardly extending, peripheral flange in spaced parallelism with the ceiling below said orifices operable to preclude impingement of the high velocity fire suppressant streams against adjacent portions of the ceiling.

4,351,394

METHOD AND SYSTEM FOR AIRCRAFT FIRE PROTECTION

William A. Enk, 1213 Horizon Dr., Blue Springs, Mo. 64015

Filed Dec. 28, 1979, Ser. No. 107,920
Int. Cl.[3] A62C *3/08, 37/18;* B64D *45/00*
U.S. Cl. 169—61 9 Claims



1. In an aircraft fire protection system having means for applying extinguishant to selected fire zones of the aircraft, the improvement comprising:

a fire responsive sensor in each fire zone having a first condition when a fire condition is sensed and a second condition when a fire condition is not sensed;

an electric circuit for each sensor, each circuit being completed when the corresponding sensor is in the first condition and interrupted when the corresponding sensor is in the second condition;

indicator means for indicating which of the circuits are completed to provide an indication of which fire zones are exposed to fire conditions; and

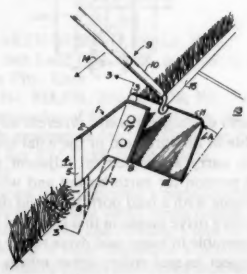
test means for selectively testing each circuit with the extinguishant applying means remaining operative to apply extinguishant to each fire zone, said test means being operable with each sensor in the second condition thereof to test the ability of each circuit to effect completion thereof when the corresponding sensor is subsequently disposed in the first condition thereof.

4,351,395

LAWN EDGER AND TRIMMER

George S. Lilley, 101 E. Pierson Ave., Somers Point, N.J. 08244

Filed Sep. 3, 1980, Ser. No. 183,645
Int. Cl.[3] A01G *3/06;* A01B *1/12*
U.S. Cl. 172—13 6 Claims



1. A sidewalk edger and lawn trimmer implement, comprising:

a one-piece edger and trimmer having a vertical cutting blade portion with a cutting edge; also having an obliquely downwardly and forwardly angled extension portion formed integrally with said edger and trimmer adjacent and generally perpendicular to said vertical portion, said obliquely angled portion providing a groove maker and a hoe attachment portion;

a hoe means having a horizontal edge means for scraping the top surface of the sidewalk and for providing variable control of said vertical portion and said groove maker; and

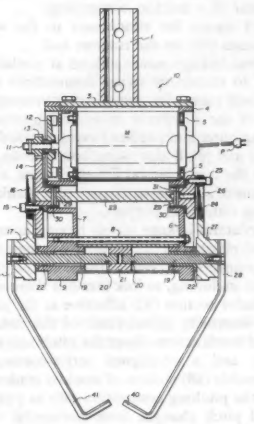
means connecting said one-piece edger trimmer to said hoe.

4,351,396

OSCILLATING POWERED CULTIVATING TOOL

Lee J. Moulton, Carmichael, Calif., assignor to Hawaiian Motor Company, Long Beach, Calif.

Filed Jan. 30, 1981, Ser. No. 229,925
Int. Cl.[3] A01B *35/00*
U.S. Cl. 172—40 7 Claims



1. A powered cultivating tool or the like comprising, in combination:

a housing having a top portion including a handle supported thereon, said housing defining an enclosure within a topmost portion of which a prime mover is disposed,

ventilation means for said prime mover,

an output shaft extending from said prime mover without said housing,

a pinion fixed to said output shaft and an axle having opposite extremities with a gear carried on one of said extremities, said gear being adapted to mesh with said pinion, said axle supported on bearings within said housing and being vertically below and parallel to said prime mover's output shaft and having both said extremities extending without said housing,

a roller on said gear, axially offset from said axle defining a first cam,

a spindle means vertically below and parallel to said axle disposed in said housing supported on bearings and having terminal portions extending outwardly from said housing,

a first cam follower fixed on said spindle means having an upwardly open U-shaped bifurcated portion straddling said roller,

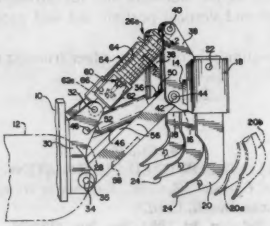
and a cultivating tine fixed to said cam follower and said spindle for pendulum like oscillation in response to movement said roller through said prime mover.

4,351,397

VIBRATING RIPPER

Bernard L. Winker, Prospect, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Mar. 10, 1980, Ser. No. 129,448
Int. Cl.³ A01B *61/00*
U.S. Cl. 172—464 **5 Claims**



1. A vibrating ripper assembly to swingably suspend ripper teeth shanks from vertical support plate means carried by, and across the rear of, a tractor, comprising:

attachment means for attachment to the vertical support plate means (**10**) on the tractor; and

quadrilateral linkage means affixed at a relatively inner end thereof to stationary swing connections (**32, 34**) on the attachment means for swinging movement by the linkage means of the relatively outer end portion thereof, said swinging outer end portion having vertically spaced-apart pitching and pitch axis swing connections (**40, 42**) linking same in the quadrilateral linkage means, and further having means of suspending ripper teeth shanks (**20**) from said swinging outer end portion;

said quadrilateral linkage means having an upper link member (**54***a*) pivoted to the vertically spaced relatively upper swing connection to render the same the pitching connection, and including, as link sections therein, a pitch actuator cylinder section (**82**) effective at the just said connection to internally adjust pitch of the linkage means and angle of tooth action about the pitch axis (**44**) swing connection, and a co-aligned series-connected elastically compressible (**68**) section of stocked conical springs effective at the pitching connection (**40**) to yieldably adjust to external pitch changes from horizontal vibratory tooth action about the pitch axis swing connection (**42**).

4,351,398

WELL DRILLING APPARATUS

Klaar Prins, Savornin Lohmanlaan 7, Velsen, and Reinout K. N. J. Prins, Dorpsstraat 940, Assendelft, both of Netherlands

Filed Jul. 13, 1979, Ser. No. 57,429
Int. Cl.³ E21B *3/04, 15/00*
U.S. Cl. 173—104 **1 Claim**

1. In a drill rig for drilling wells,

a derrick adapted to hold and lower a conductor string and drill pipe string,

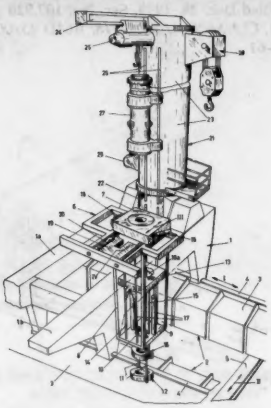
means for holding the lowered conductor string,

a support frame fixed to said derrick to extend over the well to be drilled,

a column excentrically positioned relative to the support frame, said column carrying at least one load arm and vertical guide means for a hammering device, said load arm, guide means and said hammering device being selectively rotatably adjustable between an active position in alignment with the support frame and an inactive position out of alignment therewith,

a rotary table for holding and rotating the drill pipe string, said rotary table being movably mounted on said frame to be displaceable between an active position in alignment with the axis of the well and an inactive position laterally therefrom

drill pipe holding means movably mounted on said frame below said rotary table for displacement between a first position laterally of the axis of said well and a second position in alignment with the axis of said well, and



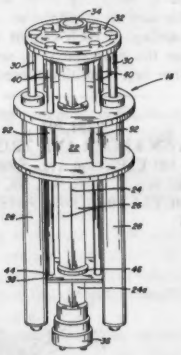
means for displacing said rotary table and means for displacing said drill pipe holding means, whereby said rotary table may be removed from alignment with the axis of the well and said drill pipe string simultaneously held without removal from said well.

4,351,399

DRILL

Roland R. Lapointe, Claremont, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 3, 1980, Ser. No. 166,264
Int. Cl.³ B23Q *5/00;* **E21C** *5/00;* **B23Q** *5/027, 5/033*
U.S. Cl. 173—148 **23 Claims**



1. In an earth drilling apparatus wherein an elongated drive rod is movable in the direction of the axial extent thereof and is adapted to carry an implement adjacent a first end of a forward end portion for earth boring and wherein said drive rod is cooperable with a feed portion of said drilling apparatus and with a rotary drive means in that said feed portion includes feed means operable to move said drive rod in such axial direction with respect to said rotary drive means and said rotary drive means is operable to drive said drive rod in axial rotation, the improvement comprising:

centralizer means adjacent a second end of said forward end portion and slidably cooperable with said forward end

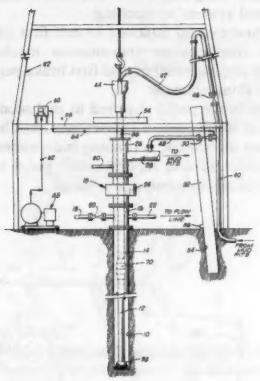
portion of said drive rod and capable of axial movement in conjunction therewith for stabilizing said forward end portion of said drive rod during such earth boring.

4,351,400

METHOD OF PREVENTING DRILL STRING OVERFLOW

Ben V. Faulkner, Rte. 1, Box 15, Washington, Okla. 73093

Filed Oct. 31, 1980, Ser. No. 202,797
Int. Cl.³ E21B *21/14*
U.S. Cl. 175—69 **5 Claims**



1. A method of preventing drilling fluid overflow when adding or removing drill pipe sections to or from a drill string disposed in a well bore comprising the steps of:

introducing gasified drilling fluid into said drill string until a predetermined volume thereof is introduced therein at a predetermined pressure thereby displacing non-gasified drilling fluid downwardly within said drill string and upwardly within the annulus between said drill string and said well bore to lower the level of non-gasified drilling fluid in said drill string a distance such that upon releasing the pressurized gasified drilling fluid from said drill string and removing drilling fluid and gas therefrom, the resulting level of drilling fluid in said drill string is below the level at which said drill pipe sections are added to or removed from said drill string;

releasing said pressurized gasified drilling fluid from said drill string whereby said gasified drilling fluid flows upwardly through said drill string and drilling fluid and air are removed therefrom; and then

adding or removing drill pipe sections to or from said drill string.

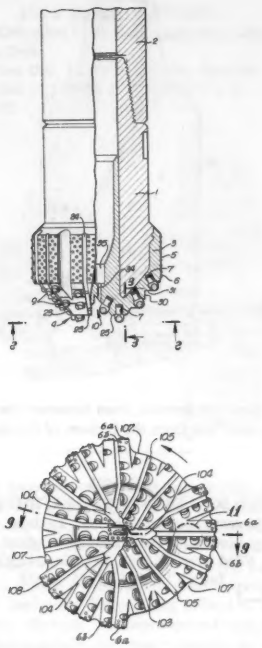
4,351,401

EARTH-BORING DRILL BITS

Coy M. Fielder, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Division of Ser. No. 913,571, Jun. 8, 1978, Pat. No. 4,244,432, which is a continuation of Ser. No. 704,424, Jul. 12, 1976, abandoned. This application Jun. 13, 1980, Ser. No. 159,181
Int. Cl.³ E21B *10/46, 10/56*
U.S. Cl. 175—329 **6 Claims**

1. An earth-boring bit comprising a metallic shank having a fluid passage, one end of said shank being coated with a hard material bonded to said end and forming a face of said bit, said hard material having a wear resistance substantially greater than that of said metallic shank, preformed sockets in said hard material of said face, preform cutters mounted in said sockets and extending to substantially the gage of the bit, each of said cutters including a plurality of abrasive particles bonded into a preform, and penetration control diamonds embedded in said hard material adjacent to the gage of the bit and extending around the gage of the bit, said control diamonds projecting from said hard material, the extent of projection of said control



diamonds from said hard material being substantially less than the extent of projection of said preform cutters from said hard material.

4,351,402

BODY STRUCTURE AND NOZZLE FOR ENHANCING THE FLOW OF DRILLING FLUID IN A ROTARY DRILL BIT

Eduardo B. Gonzalez, Ave. Universidad Num. 482, Mexico 13, D.F., Mexico

Filed May 27, 1980, Ser. No. 153,683
Int. Cl.³ E21B *10/60*
U.S. Cl. 175—340 **22 Claims**

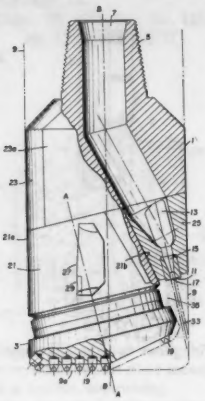
1. A rotary drill bit for drilling a bore hole in the surface of the earth, said drill bit comprising:

(a) a body means having a duct means therethrough for carrying drilling fluid;

(b) a conical cutting head having an axis at an acute angle with respect to the axis of said drill bit, said cutting head having a conical head portion with a plurality of teeth thereon and a stem portion, said stem portion being positioned in said body means for mounting said cutting head on said body means; and

(c) an elongated nozzle means positioned at the end of said duct means for injecting said drilling fluid in an arcuate jet into the bore hole, said nozzle means having an opening means opening into said bore hole, wherein the longitudinal center line of said opening means is arcuate and follows the locus of the midpoint between the side wall of the bore hole, adjacent said nozzle means, and the outermost circumference of the side of the cutting head means, on

the same side of the axis thereof as said nozzle means, wherein the drilling fluid injected through said nozzle



means removes detritus from between the teeth of said cutting head and from the bottom of the bore hole.

4,351,403

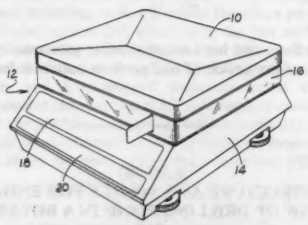
WEIGHING SCALES INCORPORATING PRINTERS

Andrew C. Ferguson, Sutton Coldfield, England, assignor to W. & T. Avery Limited, West Midlands, England

Filed Mar. 9, 1981, Ser. No. 242,037

Int. Cl.³ G01G *23/38, 23/18*

U.S. Cl. 177—2 **8 Claims**



1. A weighing scale including printing means characterised in that the load receiving platform of the scale is mounted on a load cell for providing an electrical representation of the applied load, the scale includes a main housing accommodating the load cell, and said printing means is accommodated within a space between said platform and said housing, directly beneath said platform.

4,351,404

BRAKE CONTROL SYSTEM FOR A COMBINATION CAR SYSTEM

Isao Igarashi, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 17, 1980, Ser. No. 207,452

Claims priority, application Japan, Nov. 16, 1979, 54-158753[U]

Int. Cl.³ B60D *7/00*; B60K *26/04*; B62D *63/00*

U.S. Cl. 180—14 R **7 Claims**

1. In a combination car system, comprising:

(a) a first car, capable of running independently, comprising a first pair of front wheels by which said first car is driven, a first pair of rear wheels, and a first wheel braking element displacement of which provides braking performance for said first car; and

(b) a second car, capable of running independently, comprising a second pair of front wheels, a second pair of rear wheels by which said second car is driven, and a second wheel braking element displacement of which provides braking performance for said second car;

(c) said first car and said second car being couplable together into a coupled car which runs on said first pair of front wheels of said first car and said second pair of rear wheels of said second car, with said first pair of rear wheels of said first car and said second pair of front wheels of said second car being removed from road contact:

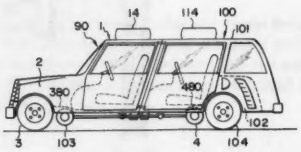
a brake control system, comprising:

(d) a first brake pedal attached to said first car;

(e) a first displacement transmission mechanism, which transmits displacement of said first brake pedal to said first wheel braking element;

(f) a second brake pedal attached to said second car;

(g) a second displacement transmission mechanism, which, when said second car is running independently, transmits displacement of said second brake pedal to said second wheel braking element, comprising:



(g1) a connection unit;

(g2) a first displacement transmission submechanism, which, when said second car is running independently, is removably drivingly coupled to said connection unit, and which at this time transmits displacement of said second brake pedal to said connection unit; and

(g3) a second displacement transmission submechanism, which transmits displacement of said connection unit to said second wheel braking element;

(h) and a third displacement transmission mechanism which, when said first car and said second car are coupled together into said coupled car, extends from a part of said first displacement transmission mechanism to be removably drivingly coupled to said connection unit, said first displacement transmission submechanism being at this time uncoupled from said connection unit;

(i) whereby, when said first car and said second car are coupled together into said coupled car, the braking operation of said first car and the braking operation of said second car are coupled together and are controlled from said first car by displacement of said first brake pedal, the controlling operation of said second brake pedal being at this time disenabled.

4,351,405

HYBRID CAR WITH ELECTRIC AND HEAT ENGINE

Gerald M. Fields, Brentwood, and Robert G. Metzner, Beverly Hills, both of Calif., assignors to Hybricon Inc., North Hollywood, Calif.

Continuation-in-part of Ser. No. 950,795, Oct. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 885,797, Mar. 13, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 98,930

Int. Cl.³ B60K *41/00, 7/00*

U.S. Cl. 180—65 A **18 Claims**

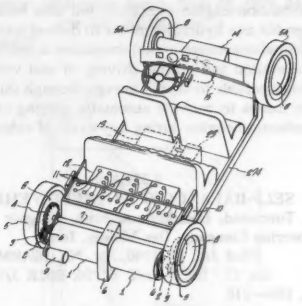
1. A vehicle comprising

a supporting structure having wheels rotatably mounted relative to said supporting structure;

a heat engine mounted on said supporting structure for driving at least a first said wheel, and having a fuel metering device;

a battery powered electric motor mounted on said supporting structure for driving at least a second said wheel, said electric motor having an armature winding;

means for controlling average power flowing through said armature winding and having a control input and power terminals through which the current in said armature winding flows responsive to a control signal at said control input;



a mode select input;

means for heat engine and electric motor speed control having a single accelerator pedal for alternately controlling either said fuel metering device or said control signal at said control input in accordance with a signal at said mode select input; and

a mode selection means for selecting which of said fuel metering device or said control signal said means for heat engine and electric motor speed control is to control and for sending said signal to said mode select input.

4,351,406

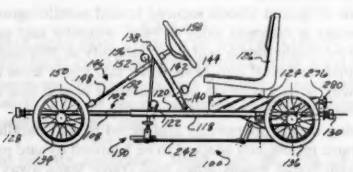
VELOCIPEDE FOR THE PHYSICALLY HANDICAPPED

Larry D. Lay, 26078 Alger, Madison Heights, Mich. 48071

Continuation-in-part of Ser. No. 965,573, Dec. 1, 1978, Pat. No. 4,284,157. This application Aug. 14, 1980, Ser. No. 178,033

Int. Cl.³ B60K *1/00*

U.S. Cl. 180—65 R **18 Claims**



1. A vehicle for the physically handicapped comprising:

a frame;

a carriage portion mounted on said frame;

at least one front and two rear wheels;

means, operably connected to said front wheel, for steering said vehicle;

means for driving at least one of said front and rear wheels, said driving means comprising:

a foot support connected to said driving means and adapted for reciprocal movement;

a brace connected to said foot support for connecting the leg of the occupant to said foot support; and

means, operably connected to said drive means, for preventing the transmission of driving force to said foot support when reciprocal movement of said foot support is hindered by the leg of the occupant.

4,351,407

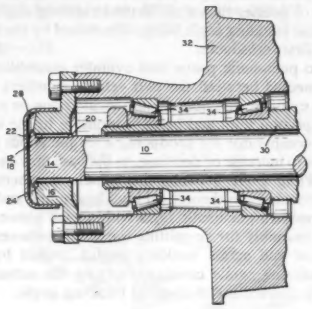
AXLE DRIVE ASSEMBLY

Enos P. Call, Columbia City, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 21, 1979, Ser. No. 106,138

Int. Cl.³ B60B *37/00*; F16J *15/10*

U.S. Cl. 180—75 **2 Claims**



1. In a drive assembly comprising an axle tube, a hub rotatably supported on said tube, a drive axle shaft extending through said tube, said axle shaft including external splines at one end thereof, said splines having inner and outer extremities, said assembly further comprising a drive flange having mating internal splines mounted over said external splines of said axle shaft, said drive flange being affixed to said hub for driving rotation thereof; an improvement comprising said drive flange being axially and non-rotatably secured to said axle shaft via the combination of

(a) a forged flange formed at said outer extremity of said splines of said axle shaft whereby said drive flange is urged against said inner extremity of said splines of said axle shaft, and

(b) a helix in at least one of said mating splines whereby an interference fit is achieved between said shaft and drive flange.

4,351,408

ARTICULATED VEHICLE

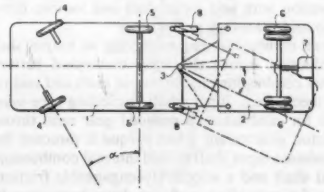
Hans Moll, Augsburg, Fed. Rep. of Germany, assignor to MAN Maschinenfabrik Augsburg-Nürnberg AG, Munich, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,441

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852613

Int. Cl.³ B62D *53/000*

U.S. Cl. 180—135 **2 Claims**



1. An articulated vehicle comprising:

(a) a front member having at least two axles, the forwardmost axle being steerable,

(b) a rear member, connected to the front member by a pivotal joint, having at least one axle and an engine for driving that axle,

(c) a first transducer for producing a signal representative of the angle between the steerable axle and another non-steerable axle of the front member,

(d) a second transducer for producing a signal representative of the buckling angle between the longitudinal centerlines of the front and rear members,

(e) comparator means for receiving the signals from the transducers and for producing a signal in the event that the actual buckling angle between the vehicle members is less or greater than a theoretical buckling angle, the theoretical buckling angle being determined by the signal from the first transducer,

(f) two pneumatic piston and cylinder assemblies pivotally connected between the two vehicle members, the piston and cylinder assemblies being located one on each side of the pivotal joint and being responsive to the signal from the comparator for producing a torque about the pivotal joint to increase or decrease, as the case may be, the actual buckling angle between the vehicle members so that it approaches the theoretical buckling angle, and

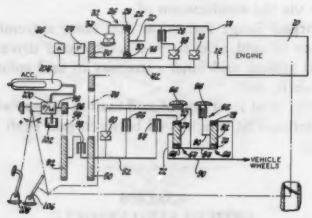
(g) a resilient pneumatic fluid within each piston and cylinder assembly for permitting variations between the theoretical and actual buckling angles, caused by roadway conditions, while constantly urging the actual buckling angle toward the theoretical buckling angle.

4,351,409

VEHICLE DRIVE SYSTEM WITH ENERGY STORAGE AND RETRIEVAL

Marvin J. Malik, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1980, Ser. No. 206,704
Int. Cl.³ F16H *47/04*; B60K *25/00*
U.S. Cl. 180—165 **2 Claims**



1. A drive system having a power transmission and an energy storage mechanism for use with a self-propelled engine driven vehicle comprising:

a multispeed planetary transmission mechanism including an input shaft, an output shaft, planetary gear means operatively connected between said input and output shaft, and a plurality of selectively engageable and disengageable friction clutch and brake means for establishing a drive connection with said input shaft and various drive ratios within said planetary gear means;

an internal combustion engine having an output shaft;

gear reduction means drivingly connected between said internal combustion engine output shaft and said transmission mechanism input shaft including one-way brake means for establishing a reduced gear ratio through said reduction gear means when torque is directed from said transmission input shaft to said internal combustion engine output shaft and a selectively engageable friction clutch means for providing a direct drive bypassing the gear reduction means;

hydraulic supply means including first and second one-way clutch means for providing a one-way drive connection from said engine output shaft and to said hydraulic supply means and from said transmission input shaft to said hydraulic supply means respectively; and

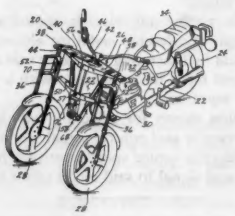
hydraulic drive and storage means for selectively storing and delivering energy including a variable displacement hydraulic translating means, a storage accumulator means, and a selectively engageable friction clutch means for selectively connecting said hydraulic translating means with said transmission input shaft in parallel drive relationship with said internal combustion engine output shaft, said hydraulic translating means being selectively operable as a hydraulic pump to store hydraulic energy in said accumulator during vehicle coasting and during internal combustion engine operation and also being selectively operable as a hydraulic motor to deliver energy from said accumulator means to said transmission mechanism during acceleration and normal driving of said vehicle and also being operable to supply energy through said gear reduction means to provide automatic starting of the internal combustion engine during any mode of vehicle operation.

4,351,410

SELF-BALANCING WHEELED VEHICLE

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Jul. 17, 1980, Ser. No. 169,804
Int. Cl.³ B62D *9/02, 61/06*; B62K *5/08*
U.S. Cl. 180—210 **10 Claims**



1. A wheeled vehicle, comprising,

a vehicle frame having opposite ends,

wheel means on one end of said frame,

a hinged parallelogram frame means having four hinged corner portions pivotally mounted on the other end of said frame, and being adapted for pivotal movement in opposite directions,

a pair of spaced wheels secured to said parallelogram frame means at opposite sides thereof, whereby said parallelogram frame means will pivot laterally in first and second opposite lateral directions when said frame leans laterally away from a position of equilibrium in said first and second lateral directions, respectively,

sensing means operatively connected to said parallelogram frame means, and adapted to be actuated by said parallelogram frame means when said frame leans away from a position of equilibrium whereby the inbalance of said frame away from a position of equilibrium actuates said sensing means, and

power means connected to said sensing means and said parallelogram frame means whereby the initial pivotal movement of said parallelogram frame means from a position of equilibrium in one of said lateral directions will automatically cause said sensing means to actuate said power means to move said parallelogram frame means in the opposite lateral direction to cause said vehicle frame to move laterally to a position of equilibrium,

said sensing means comprising a lever pivotally connected to said vehicle frame,

and said power means includes an extensible and retractable cylinder means connected at one end to said lever and

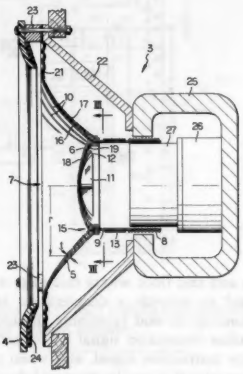
connected at the opposite end to said parallelogram frame means whereby said lever is pivoted in opposite directions with respect to said vehicle frame in response to leaning movement of said parallelogram frame means in said first and second opposite lateral directions, respectively, from a position of equilibrium.

4,351,411

SPEAKER DEVICE

Kenzo Inoue, 22, Kitatanda, Yabu-machi, Tokai-shi, Aichi-ken, Japan

Filed May 27, 1980, Ser. No. 153,703
Claims priority, application Japan, Aug. 29, 1979, 54-110693
Int. Cl.³ H04R *7/14*
U.S. Cl. 181—168 **7 Claims**



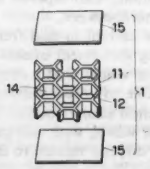
1. A speaker device comprising a diaphragm including a cone portion of synthetic resin material which is reinforced for increased rigidity with a number of circumferentially space, radially extending, integrally formed ribs, said cone portion having an average wall thickness on the order of tenths of a millimeter, and means for improving the sound reproducing capability of said speaker device and for improving the speaker device's resistance to deterioration from exposure to ultraviolet light comprising at least one layer of metal plating on all of the inside and outside surfaces of said cone portion; whereby said cone portion is given further enhanced sound reproduction capability by said at least one layer of metal plating.

4,351,412

DIAPHRAGM FOR ACOUSTIC INSTRUMENTS AND METHOD OF MANUFACTURING THE SAME

Isao Yamamuro, Tokorozawa, and Tsunehiro Tsukagoshi, Ohmori-nishi, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 97,989
Claims priority, application Japan, Nov. 30, 1978, 53-147217
Int. Cl.³ G10K *13/00*
U.S. Cl. 181—170 **15 Claims**



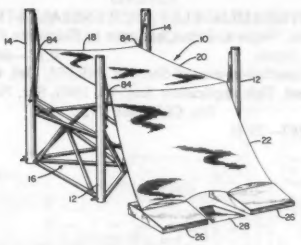
1. A diaphragm for use in an acoustic instrument comprising a body of a kneaded mixture consisting essentially of 10–90 parts by weight of flaky graphite powder and 90–10 parts by weight of a thermoplastic resin, said body including a plurality of closed interior cavities partitioned by an interior rib.

4,351,413

DECELERATION APPARATUS FOR SAFETY NETS

Wayne E. Simon, P.O. Box 125, Evergreen, Colo. 80439

PCT No. PCT/US79/00326, § 371 Date Jan. 15, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02507, PCT Pub. Date Nov. 27, 1980
PCT Filed May 15, 1979, Ser. No. 245,345
Int. Cl.³ A62B *1/22*
U.S. Cl. 182—139 **18 Claims**



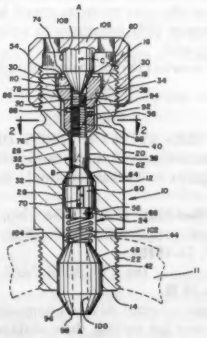
1. A landing net assembly adapted for cushioning the impact of a free falling body comprising a landing net and a plurality of support members in outer surrounding relation to said landing net, a dampening device associated with at least one of said support members, said dampening device including a chamber filled with a fluid, a float suspended in said fluid, and connecting means interconnecting each said float and an outer peripheral edge portion of said net so that the displacement of said landing net imparted to the outer peripheral edge portion adjacent said dampening device will cause a displacement of its respective float in said chamber.

4,351,414

LUBRICANT FITTING

Jeff L. Merten, Rosenberg, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 6, 1980, Ser. No. 156,899
Int. Cl.³ F01M *1/18*; F16N *21/06*
U.S. Cl. 184—105 B **8 Claims**



1. A lubricant fitting adapted to be connected to a valve body comprising:

an elongate body having a central bore therethrough, said

central bore having an intermediate bore portion and opposite bore end portions of enlarged diameters joined by said intermediate bore portion;

an annular seat formed at the juncture of each of said end bore portions with said intermediate bore portion;

an elongate valve member mounted within said central bore having an intermediate section and opposite end sections joined by said intermediate section, each of said end sections having an annular shoulder in an opposed facing relationship to its corresponding said annular seat; and

a threaded connection between said end sections for allowing said end sections to move longitudinally relative to each other upon the relative rotational movement between said end sections to selectively place said opposite end bore portions in fluid isolation.

4,351,415

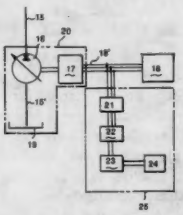
HYDRAULIC ELEVATOR INSTALLATION

Yasuo Kita, Nagoya, Japan, assignor to Shimadzu Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 949,155, Oct. 6, 1978, abandoned. This application Aug. 12, 1980, Ser. No. 177,386

Int. Cl.³ B66B *1/26*

U.S. Cl. 187—29 B **2 Claims**



1. A hydraulic elevator installation comprising:

(a) an elevator cage (**11**);

(b) a hydraulic actuator, including a cylinder (**14**) having a plunger (**13**) connected to said elevator cage (**11**);

(c) a hydraulic pump (**16**) having a variable output for supplying said hydraulic actuator with pressure fluid wherein said pump (**16**) functions to operate as a hydraulic motor, driven with the pressure fluid discharged from said cylinder (**14**) when said elevator cage (**11**) is descending, said pump being adjustable to maintain the rotational direction of a drive shaft of the pump the same during ascending and descending of said elevator cage;

(d) an induction motor (**17**) for driving said hydraulic pump (**16**), wherein said induction motor (**17**), when driven at a speed over the synchronous speed by means of said hydraulic motor (**16**) functions to operate as an induction generator; and,

(e) a power source (**18**) for driving said induction motor (**17**).

4,351,416

ELEVATOR CONTROL DEVICE

Narihiro Terazono, and Ryuichi Kajiyama, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1980, Ser. No. 207,547

Claims priority, application Japan, Nov. 19, 1979, 54-149701; Nov. 22, 1979, 54-151835

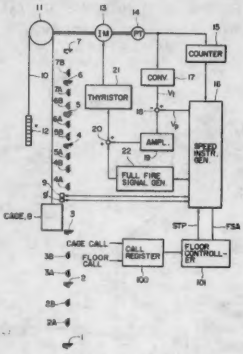
Int. Cl.³ B66B *1/30*

U.S. Cl. 187—29 R **3 Claims**

1. An elevator control device comprising:

memory means for storing floor distance codes representative of distances between floors; and

means for determining which floors are to be traversed, selectively reading out of said memory means said floor distance codes corresponding to said floors to be traversed, synthesizing said floor distance codes, whereby a distance to be traversed is determined, and selecting at least one of an operational mode in which said cage is run at a maximum rated speed and an operational mode in which said cage is run at a speed lower than said maximum rated speed in accordance with said distance to be traversed so that said cage is accelerated by an acceleration instruction signal, and when said cage reaches a position a predetermined distance before said floor where said cage is to be stopped, the remaining distance between said



position and said floor where said cage is to be stopped is calculated to provide a deceleration instruction signal corresponding to said remaining distance, wherein said acceleration instruction signal is compared with said deceleration instruction signal, and when said acceleration instruction signal is smaller than said deceleration instruction signal, said acceleration instruction signal is provided as a speed instruction signal while when said acceleration instruction signal is equal to or larger than said deceleration instruction signal, said deceleration instruction signal is provided as a speed instruction signal.

4,351,417

SPEED RETARDER

Frederick G. Seiz, Telford, and Carl G. Seiz, Hatfield, both of Pa., assignors to Variable Control Systems, Inc., Telford, Pa.

Filed Nov. 17, 1980, Ser. No. 207,622

Int. Cl.³ B66B *5/16*

U.S. Cl. 187—81 **22 Claims**

1. A speed retarder for use with a flexible member comprising:

a frame,

an axle mounted in said frame;

a pair of wheels rotatably mounted on said axle with at least one wheel of said pair also being axially movably mounted on said axle,

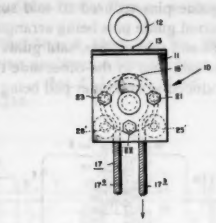
at least said one wheel having an outboard braking surface and a tapered inboard surface,

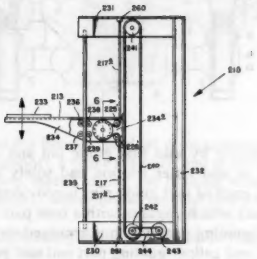
another wheel of said pair of wheels having an inboard surface confronting said tapered surface to define a peripheral gap therebetween,

brake pad means carried in said frame and operable upon outward sliding movement of said one wheel to slidably engage said one wheel with a continuous axially inward pressure operable to create between said one wheel and said frame friction acting counter to the rotational direction of said one wheel, with said pressure, and hence said friction, being directly related to the tension on the flexible member,

guide means carried by said frame for engaging said flexible member and maintaining the same engaged in said wheel gap through a predetermined arcuate extent,

whereby motion of the flexible member with tension thereon urges said one wheel outwardly to create said friction for





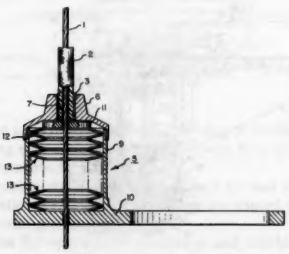
retarding rotation of said wheels and thereby to retard the speed of the flexible member.

4,351,418

VEHICLE BRAKE COMPENSATOR

Cooper C. Woodring, Plandome, and Philip A. Torbet, Port Washington, both of N.Y., assignors to J.C. Penney Company, Inc., New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,023
Int. Cl.³ B62L *3/02*
U.S. Cl. 188—24.22 **37 Claims**



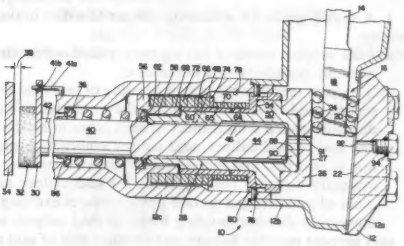
1. An apparatus for controlling the application of a braking force to a wheel of a vehicle, the apparatus being disposed in a vehicle braking system of the type having a braking member which applies the braking force in response to a displacement of an actuation member, the braking and actuation members communicating with one another by a cable which is disposed for at least a portion of its length within a sheath, the actuation member being of the type which transmits braking information to the braking member by applying a tensile force to the cable, which tensile force corresponds to a simultaneous compressive force applied to the sheath, the apparatus being characterized in that there is provided resilient means for producing a dimensional displacement in response to a compressive force, said dimensional displacement of said resilient means being in accordance with a predetermined force-displacement characteristic of said resilient means so as to reduce the braking force applied to the braking member in response to the displacement of the actuation member, said resilient means comprises a compression member having first and second ends and being circumferentially disposed about the cable.

4,351,419

AUTOMATIC SLACK ADJUSTER

Wayne Garrett, Troy, and Richard F. Neuman, Farmington, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 7, 1980, Ser. No. 147,643
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—71.9 **31 Claims**



1. An automatic, single acting, clearance sensing slack adjuster for maintaining a predetermined running clearance between the selectively engageable friction surfaces of a brake comprising:

a displaceable brake actuation means;

a rotatable driving member;

means for automatically rotating said driving member in response to greater than predetermined displacement of said brake actuation means;

a rotatable intermediate member coaxial with and adjacent said driving member, said intermediate member rotatable relative to said driving member;

a rotatable driven member coaxial with and adjacent said intermediate member, said driven member rotatable relative to said intermediate member;

a rotatable adjustment member rotatably driven by said driven member, rotation of said adjustment member in a given direction of rotation effective to decrease slack in the brake and in the other direction or rotation to increase slack in the brake;

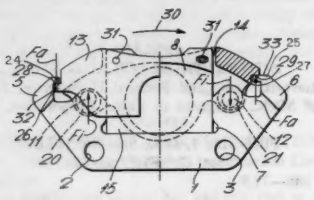
a first coil clutch for rotationally coupling one of said driving member to said intermediate member and said intermediate member to said driven member, said first coil clutch wound to transfer torque in the high torque transfer capacity direction of rotation thereof when rotating said adjustment member in said given direction of rotation and to transfer torque in the low torque transfer capacity direction of rotation thereof when rotating in said other direction of rotation; and

a second coil clutch for rotationally coupling the other of said driving member to said intermediate member and said intermediate member to said driven member, said second coil clutch wound to transfer torque in the low torque transfer capacity direction of rotation thereof when rotating said adjustment member in said given direction of rotation.

4,351,420
SLIDING GUIDE FOR A FLOATING CALIPER DISC BRAKE

Jochen Burgdorf, Offenbach, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,682
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934219; Sep. 26, 1979, 2938926
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.45 **28 Claims**



1. A sliding guide for a floating caliper of a disc brake comprising:

a brake support member having two spaced arms extending over the periphery of a brake disc;

said support member having on one side of said disc first and second guide surfaces parallel to the rotational axis of said disc and spaced with respect to each other to axially guide one end of said caliper, said caliper embracing said disc, one of said first and second guide surfaces exerting a first inwardly directed holding force on said caliper and the other of said first and second guide surfaces exerting a first outwardly directed holding force on said caliper; and

said support member having on the other side of said disc in each of said two arms a different one of third and fourth guide surfaces parallel to the rotational axis of said disc to axially guide the other end of said caliper, one of said third and fourth guide surfaces exerting a second inwardly directed holding force on said caliper and the other of said third and fourth guide surfaces exerting a second outwardly directed holding force on said caliper;

said one of said first and second guide surfaces and said other of said third and fourth guide surfaces are disposed on one side of the rotational axis of said disc and said other of said first and second guide surfaces and said one of said third and fourth guide surfaces are disposed on the other side of the rotational axis of said disc such that a combined inwardly directed holding force is exerted on said caliper along a first line interconnecting said one of said first and second guide surfaces and said one of said third and fourth guide surfaces and a combined outwardly directed holding force is exerted on said caliper along a second line crossing but not intersecting said first line and interconnecting said other of said first and second guide surfaces and said other other of said third and fourth guide surfaces.

4,351,421
DISC BRAKE

Masayuki Kurata, Kazo, and Yushiyo Watanabe, Kuki, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,984
Claims priority, application Japan, Aug. 10, 1979, 54-102020
Int. Cl.³ F16D *55/224*
U.S. Cl. 188—73.45 **7 Claims**

1. A disc brake comprising:

a disc which is arranged to have the brake applied thereto;

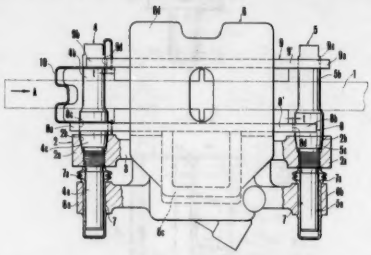
inner and outer friction pads;

a caliper provided with a thrusting mechanism which is arranged to cause said inner friction pad to engage with one side of said disc, said caliper being arranged to move to cause said outer friction pad to engage with the other side of the disc by a reaction to a thrusting action of said thrusting mechanism;

a support member; and

first and second guide pins secured to said support member, said first and second guide pins being arranged to guide said two friction pads and said caliper, said guide pins extending from one side of said disc to the other side thereof,

a brake torque produced at said inner pad being arranged to be

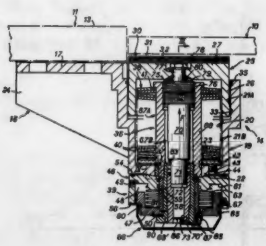


received solely by said first guide pin and a brake torque produced at said outer friction pad solely by said second guide pin, each of said guide pins is provided with a caliper guiding part which engages with a boss part of said caliper; and a pad guiding part which is arranged to carry said friction pads, said caliper guiding part and said pad guiding part being formed into one unified body, each of said guide pins being fixedly screwed to said support at a point between said two guiding parts.

4,351,422
INDUSTRIAL DISC BRAKE

Jean Chauve, Nevers, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 25, 1980, Ser. No. 143,558
Claims priority, application France, Apr. 26, 1979, 79 10592
Int. Cl.³ F16F *65/20*
U.S. Cl. 188—170 **15 Claims**



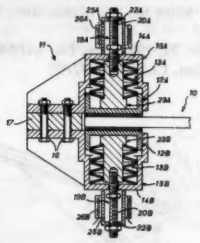
1. A disc brake for industrial use of the type comprising, in association with a brake disc, a fixed support having a bore facing the brake disc with the axis of said bore being perpendicular to said brake disc, a brake shoe axially displaceable in said bore in a first direction relative to the brake disc in response to resilient control means bearing against said fixed support, and in a second direction opposite to the first direction in response to an actuating unit carried by said fixed support, the improvement comprising swivel contact means between said brake shoe and said fixed support, said swivel contact means comprising a contact surface formed on a selected one of said brake shoe and said fixed support for contact with the nonselected one of said brake shoe and said fixed support.

4,351,423

METHOD FOR LIMITED, GRADUAL DISENGAGEMENT OF A BRAKE, AND SUCH A BRAKE

Leonce Rogier, Saint-Denis, France, assignor to Valeo, Paris, France

Filed Nov. 4, 1980, Ser. No. 203,950
Claims priority, application France, Nov. 14, 1979, 79 28034
Int. Cl.³ B60T *13/04*
U.S. Cl. 188—216 10 Claims



1. A method for limited, gradual disengagement of a brake comprising a support, a brake member, and at least one braking member, resilient means urging the braking member towards said brake member, wherein said method comprises the steps of:

attaching said braking member to a stud having an abutment thereon;

interposing a thermally expandable wedging member between said support and said abutment; and

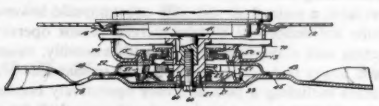
heating said thermally expandable wedging member thereby disengaging said braking member gradually.

4,351,424

COMBINED CLUTCH AND BRAKE

Randall K. Lawrence, Fairview, and Aaron A. Stevens, Spring Hill, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.

Filed May 14, 1980, Ser. No. 149,931
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 R 26 Claims



1. An assembly for effecting driving or braking of a rotatable working element adapted to be driven by a powered rotatable shaft comprising:

a housing stationary with respect to said shaft and having stationary first surface means associated therewith;

a working element;

means for operatively mounting said working element with respect to said rotatable shaft so that in a first position said working element operatively engages said rotatable shaft for rotation therewith, and in a second position said working element operatively engages said housing and remains stationary with respect to said shaft;

means for actuating said working element operatively mounting means for moving it between said first and second positions thereof; and

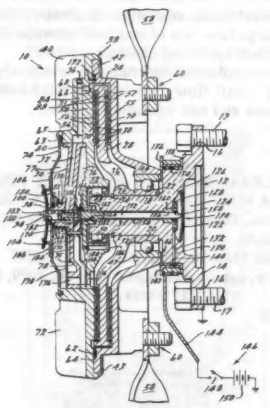
said operatively mounting means comprising a drive plate disposed between said housing and said working element, and fixed to and coaxial with said rotatable shaft and having second surface means associated therewith; an adapter plate fixed to said working element and coaxial with said rotatable shaft and having third and fourth surface means associated therewith, said adaptor plate mounted between said housing first surface means and said drive plate along the axis of said rotatable shaft with said third surface means aligned with said first surface means, and said fourth surface means aligned with said second surface means; and means for mounting said adaptor plate for movement parallel to the axis of said rotatable shaft in response to actuation by said actuation means, from said first position wherein said first and third surface means operatively frictionally engage each other and said second and fourth surface means do not operatively engage, to said second position wherein said first and third surface means are not operatively engaged and said second and fourth surface means operatively frictionally engage each other.

4,351,425

DUAL STAGE CONTROL FOR VISCOUS FLUID COUPLING

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1980, Ser. No. 220,928
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B 15 Claims



1. A viscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces;

means operative to generate a flow of viscous fluid between said surfaces;

means operative to modulate said flow as a function of a first sensed fluid temperature; and

means operative to further modulate said flow as a function of a second sensed fluid temperature.

4,351,426

SINGLE STAGE CONTROL FOR VISCOUS FLUID COUPLING

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1980, Ser. No. 220,929
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B 21 Claims

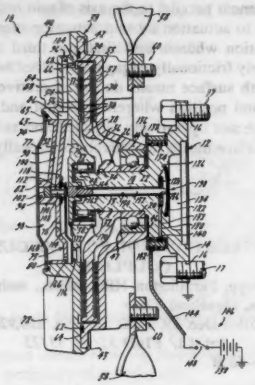
1. A viscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis;

shear surfaces disposed on said first and second members and forming an operating chamber therebetween;

fluid storage means disposed adjacent said operating chamber;

means operative to generate a circulating flow of viscous fluid between said chamber and storage means;



first flow control means operative to selectively establish a relatively large flow rate of said fluid between said storage means and said operating chamber; and

second flow control means operative to selectively establish a relatively small flow rate of said fluid between said storage means and said operating chamber.

4,351,427

CLUTCH RELEASE BEARING ASSEMBLY PROVIDED WITH A SELF-CENTERING MECHANISM

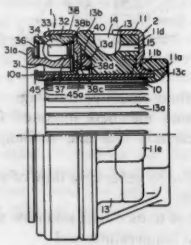
Takashi Miyahara, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 132,178

Claims priority, application Japan, Apr. 10, 1979, 54-42511

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **3 Claims**



1. In a clutch release bearing assembly of the self-centering type usable with a clutch and comprising a clutch release bearing device, holding means movable axially of the clutch for holding said bearing device and movable in a direction perpendicular to the axial direction of the clutch for centering the bearing device, and a plastic deformation member disposed in the path of the thrust force between the holding means and the bearing device, the improvement comprising said holding means including a base portion formed of metal and having a cylindrical base, and an insert portion formed of a hard synthetic resin and secured integrally with said base portion, wherein the bearing device includes a rotatable race, a stationary race, rollers between both the races and a supporting member securely holding the stationary race, the supporting member having a radially extended portion adapted to form between the radially extended portion and the synthetic resin portion a chamber receiving the plastic deformation member, and the holding means includes a further metallic guide member held in contact with said radially extended portion to support the bearing device movably in a direction perpendicular to the axial direction of the clutch.

4,351,428

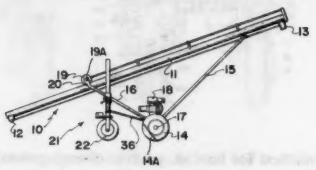
POWERED WHEEL ASSEMBLY FOR GRAIN AUGERS AND THE LIKE

John M. Long, 1078 Main St. N., Moose Jaw, Saskatchewan, Canada

Filed Apr. 21, 1980, Ser. No. 141,968

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—302 **8 Claims**



1. In a grain auger assembly which includes an auger tube and flight therein, a pair of ground engaging wheels mounted on an axle, and adjustable front and rear braces extending between said axle and said auger tube for adjusting the inclination of said auger tube with the rear braces extending towards the intake end of said auger and the front braces extending towards the discharge end of said auger; the improvement comprising in combination a wheel assembly secured to and depending downwardly from said rear braces, said wheel assembly including a selectively ground engaging drive wheel, a source of power for said drive wheel and steering means for said drive wheel, means mounting said wheel assembly to said rear braces, said means including a wheel fork assembly for said wheel, said wheel being journalled for rotation within said wheel fork, a plate, a lower support tube extending upwardly from said plate, said plate being secured to the upper end of said wheel fork whereby said wheel fork and said plate include means mounting same for partial rotation relative to said lower support tube, a main shaft slideably engaging said lower support tube for reciprocal motion therein, means operatively connecting said main shaft to said auger assembly, means to raise and lower said drive wheel relative to said rear braces, said means including a jack assembly operatively connected between said lower support tube and said main shaft for moving said lower support tube and said wheel fork assembly and said wheel relative to said main shaft.

4,351,429

CONVEYOR WITH SLIP CLEATS

Francis J. Garvey, Newfield, N.J., assignor to Garvey Corporation, Blue Anchor, N.J.

Continuation of Ser. No. 957,036, Nov. 2, 1978, abandoned. This application Jul. 29, 1980, Ser. No. 173,362

Int. Cl.³ B65G *15/44, 17/44*

U.S. Cl. 198—688 **7 Claims**

1. In a conveyor for upwardly transporting carton-like articles, a structure comprising

upwardly sloping track means,

chain means extending along the track means,

a plurality of flat members attached to the chain means and slidingly supported on the track means,

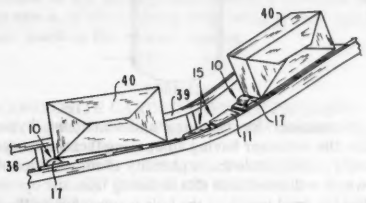
a plurality of cleat members periodically positioned between groups of the flat members and spaced apart by at least one dimension of the articles extending between the cleat members,

said cleat members being attached to the chain means and slidingly supported on the track means,

said flat members and said cleat members having bodies forming a conveying surface,

each of said cleat members including rib means extending upwardly therefrom above the conveying surface and having a leading face that extends at a slope substantially less than 90° relative to the conveying surface,

said leading faces being adapted to exert a maximum force opposing slippage of the articles on the conveying surface, which maximum opposing force is greater than the component of gravitational force of the article parallel to the conveyor surface minus the frictional forces between the



articles and conveyor but is less than forces of resistance to movement of the articles which would damage the articles,

said chain means including a drive chain formed of chain links joined by pins,

said flat members and said cleat members each including a pair of depending legs on opposite sides of a midline thereof for straddling at least one link of the chain links,

said depending legs having apertures for receiving the respective pins, and

said rib means including a pair of spaced ribs on each cleat member on opposite sides of the midline thereof to permit flexing of each cleat member at the midline to spread the pair of legs.

4,351,430

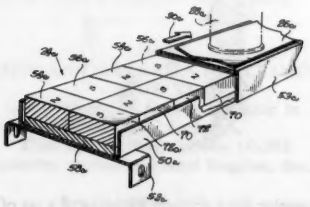
MAGNETIC RAIL CONSTRUCTION FOR CAN CONVEYOR

Wallace W. Mojden, Hinsdale, Ill., assignor to Fleetwood Systems, Inc., Countryside, Ill.

Filed May 2, 1980, Ser. No. 146,153

Int. Cl.³ B65G *15/58*

U.S. Cl. 198—690 **5 Claims**



1. In a magnetic conveyor system, the combination comprising: traveling conveyor means adapted to be transported in a predetermined linear direction; and an elongate magnetic rail extending in said linear direction and comprising a first plurality of permanent magnets having a first, common polarity confronting said conveyor means and being arranged in uniformly spaced-apart relationship in a row along said predetermined linear direction closely adjacent said conveyor means; and a second plurality of permanent magnets having a second, common polarity confronting said conveyor means and being opposite the polarity of said first plurality of magnets, said second plurality of magnets being alternately interspersed with said first plurality of magnets in the spaces therebetween said first and second plurality of magnets being in abutting surface-to-surface contact with the magnets immediately adjacent thereto along surfaces of the respective magnets which extend transversely to the linear direction of travel of the conveyor means, such that any one of said magnets of a given polarity facing said support means, except those at the end of said magnetic rail, will have the transverse surfaces thereof in abutting engagement on opposite sides thereof with magnets of an opposite polarity orientation, and common shunt plate means upon which said first and second plurality of magnets are supported, with the sides thereof opposite that facing said support means being engaged with said shunt plate means, to provide a plurality of flux paths of substantial strength.

4,351,431

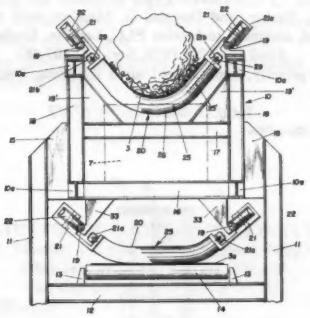
HEAVY DUTY BELT CONVEYOR

Edward A. Fenton, Jr., Pittsburgh; Ira W. Lakin, Volant, and Gilbert Blair, Corapolis, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1980, Ser. No. 166,466

Int. Cl.³ B65G *15/08*

U.S. Cl. 198—823 **16 Claims**



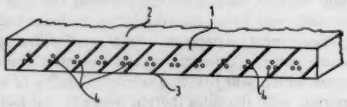
6. In an endless conveyor belt especially useful for transporting rough, heavy material and particularly broken rock that may comprise at least in part large, heavy fragments and pieces where the belt has a top reach moving from around a main pulley at the head end toward and around a discharge pulley at the opposite end, the invention comprising:

(a) an endless succession of flexibly connected spaced transverse flexible hammock members extending under said top reach of the conveyor belt, said hammock members each having a flanged trolley-wheel at each end, a pair of spaced parallel rails, one extending along each side and so spaced that the hammocks sag from their respective trolley wheels toward the center of the belt, and the loaded belt shapes itself into a continuous trough conforming to the shapes of the hammocks,

(b) means for driving the belt and hammocks in unison,

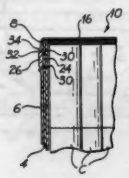
(c) the rails for the trolley wheels at the ends of the hammocks spreading apart and decreasing in elevation, with respect to belt, at the approach to the pulley at the discharge end of the belt in such manner as to cause the hammocks to straighten out and the belt to become flat in the direction transverse to its length as it passes around the discharge pulley of the conveyor.

4,351,432
CONVEYOR BELT
Giovanni Ballocci, and Aurelio Brollo, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy
Filed Mar. 11, 1980, Ser. No. 129,328
Claims priority, application Italy, Mar. 27, 1979, 21302 A/79
Int. Cl.³ F16G 1/22; B65G 15/34
U.S. Cl. 198—847 2 Claims



1. A conveyor belt comprising a band of elastomeric material having opposite faces and a tension resistant structure embedded in said band between the faces and formed of a plurality of longitudinally extending cords parallel to one another, characterized by the fact that said cords are grouped in laterally spaced triangularly shaped sets of three cords each of the same kind of material disposed longitudinally through the belt substantially parallel to each other, substantially parallel to the longitudinal axis of the belt, and substantially parallel to the said opposite faces as the sole means for imparting tension resistance to the belt.

4,351,433
CIGARETTE PACKETS
Donald J. Barber, and Douglas G. Meaden, both of London, England, assignors to Molins PLC, London, England
Filed Dec. 26, 1979, Ser. No. 107,483
Claims priority, application United Kingdom, Dec. 27, 1978, 50059/78
Int. Cl.³ B65D 85/10, 85/12
U.S. Cl. 206—264 9 Claims



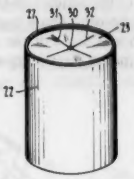
1. A cigarette packet formed from a composite rectangular blank having an outer film of thermoplastic material laminated to a fibrous substrate, such as paper, said blank when erected providing two opposed large faces, two narrow sides, a sealed longitudinal seam extending down one of said faces or down a first one of said narrow sides, a top closure and a bottom closure, wherein:

(a) each of said closures is formed by tucking in material at the respective ends of the narrow dies and successively folding over and sealing together material at the respective ends of the large faces;

(b) a band is formed by spaced rows of perforations in said fibrous substrate below said top closure and extends across at least a second one of said narrow sides and across a part of one of said large faces; and

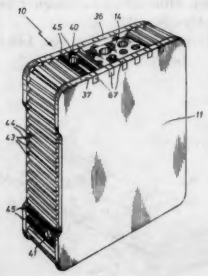
(c) a tear strip is integrally formed in said outer film of thermoplastic material, said tear strip being thicker than the remaining outer film, being bounded by lines of weakness in said outer film and being secured over said band to enable said band to be torn open to gain access to the cigarettes in the packet.

4,351,434
DISPOSAL OF NEEDLES
Benjamin Elisha, 5 Mooltan Ave., East St. Kilda, 3183, Victoria, Australia
Filed Jan. 30, 1980, Ser. No. 116,768
Claims priority, application Australia, Jan. 31, 1979, PD7508
Int. Cl.³ A61M 5/32; B02C 19/12; B21D 7/00
U.S. Cl. 206—366 7 Claims



1. A container for receiving and containing hypodermic needles, the container having an opening therein; comprising a generally circular hole and a plurality of slits or lines of weakness which will break into slits radiating from the opening; and wherein the axial length of the hole is substantially the same as the thickness of said wall whereby a disposable needle having a needle shank and a hub can be passed while mounted to a spigot on a syringe having a body so that said wall locates between said hub and said body and so that on retraction of the syringe engagement of the side of said wall within the container with said hub will move the needle off the syringe.

4,351,435
MAGAZINE FOR THE PROTECTED STORAGE OF A SET OF DRILLS
Wolfram Elwert, Ludwigsburg, and Gernot Förster, Asperg, both of Fed. Rep. of Germany, assignors to East Tradacons AG, Steinhausen, Switzerland
Filed Mar. 24, 1980, Ser. No. 133,653
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911607
Int. Cl.³ B65D 85/20, 83/02, 43/20
U.S. Cl. 206—379 24 Claims



1. A magazine for a protected storage of a set of drills and for a selective withdrawal of the drills arranged in individual pockets in the magazine, the magazine including a covering means having at least one opening movable into positions suitable for giving access to one drill at a time, by guiding displacement of the covering means, characterized in that the magazine includes a flat cuboid magazine body having narrow end faces and comprising at least two straight rows of parallel pockets with drills inserted therein over their full length, the pockets have one open end opening in a direction of one the narrow end face of the magazine body;

the covering means includes at least one covering strip; the

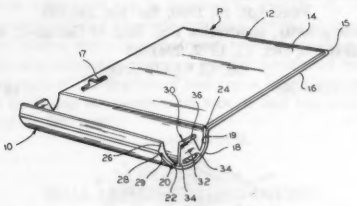
narrow end faces of the magazine body are interconnected by 90° curved transition faces and form a sliding face for the covering strip which is slidably guided along a narrow surface area of the magazine body formed by the narrow end faces and the curved transition faces; the covering strip comprises a number of selector openings corresponding to the number rows of pockets, the covering strip is displaceable and can be alternatively brought into a position giving access to the open end of a selected pocket in one row so that the selected drill can be removed therefrom, a diameter of the selector openings associated with the two rows of pockets being at least equal to a diameter of the largest drill in the respective row, and a center distance of the pockets, measured in a direction of displacement, of the covering strip, being at least equal to a clear width of the selector opening.

4,351,436

COMPOSITE CARDED DISPLAY PACKAGE

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed May 7, 1981, Ser. No. 261,499
Int. Cl.³ B65B *15/00*; B65D *73/00*
U.S. Cl. 206—477 **16 Claims**



1. In a composite paperboard and plastic carded display package, the combination of:

(a) a relatively thin, generally flat advertising card member, formed of paperboard, and, extending from one end thereof, a hollow pocket member for holding a packaged article;

(b) said pocket member including an outer paperboard shell element, formed integrally with and extending from said card member, and an inner plastic liner element bonded to said shell element;

(c) said linear element having a contour adapted to snugly engage and retain a packaged article therein.

4,351,437

METHOD AND APPARATUS FOR EXAMINING OBJECTS

Peter G. Long, Colchester, England, assignor to Lockwood Graders (UK) Limited, Essex, England

Filed Apr. 21, 1980, Ser. No. 141,763
Claims priority, application United Kingdom, Jan. 18, 1980, 8001807
Int. Cl.³ B07C *5/02, 5/00*
U.S. Cl. 209—545 **43 Claims**

1. A method of operating on a plurality of objects comprising the steps of:

supporting the objects on a floor of a conveyor means with a plurality of objects across the width of the conveyor means;

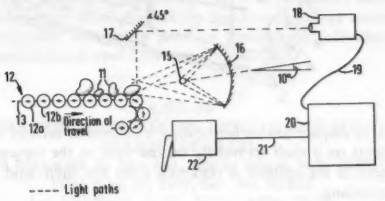
moving said floor with said objects to carry the objects through an inspection station with a plurality of objects arranged across the width of the conveyor means;

illuminating a plurality of objects at the inspection station with electromagnetic radiation incident predominantly from a first direction transverse to the width of the conveyor means;

observing the objects by a radiation detector along a second direction to detect radiation reflected by the objects;

said direction of said observation being inclined to said direction of said illumination at an angle such that said detector does not observe any portion of said floor which is illuminated by said illuminating means;

the illuminating and/or detecting steps including a scanning operation across the objects transverse to the direction of



movement of the conveyor means to provide from the detector a detection signal representing different reflected radiation from different regions along the path of scanning;

repeating the scanning operation to provide a series of scans across the objects;

processing the detection signal to provide an information signal representative of a dimensional parameter of the size of the objects; and

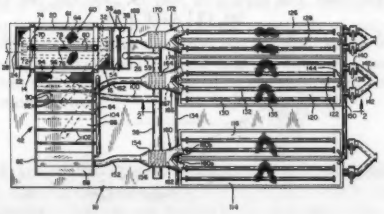
operating upon the objects by action dependent upon the information signal.

4,351,438

APPARATUS FOR ANALYZING A FISH POPULATION

Kenneth E. Morton, 141 SW. 15th #30, Bend, Oreg. 97701

Filed Jan. 12, 1981, Ser. No. 224,056
Int. Cl.³ B07B *13/05*; A01K *61/00*
U.S. Cl. 209—675 **9 Claims**



1. Apparatus for analyzing a fish population comprising:

an elevated tank for holding a volume of water,

fish-transfer means for transferring fish from a pond containing the fish population into the tank,

fish-grading means operable to sort fish and separate such according to size,

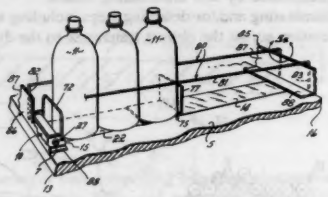
fish-passage means connecting the tank and fish-grading means providing a path for the passage of fish from the tank to said grading means,

and means within said tank for regulating the concentration of fish within said tank adjacent where said fish-passage means connects with said tank.

4,351,439
MERCHANDISE DISPLAY DEVICE

William B. Taylor, Chamblee, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 11, 1980, Ser. No. 129,341
Int. Cl.³ A47F 5/00
U.S. Cl. 211—49 D 14 Claims



1. A display device for feeding a column of serially stacked objects on a shelf forwardly on the shelf as the forwardmost object in the column is removed from the shelf, said device comprising,

a shaft,

a roller mounted upon the shaft and adapted to be rotatably journalled at the front of a shelf,

a flexible belt wrapped around said roller and secured at one end to said roller,

abutment means secured to the opposite end of said belt, said abutment means being engageable with the rearwardmost object in the column of objects stacked on the belt and being moved away from said roller as additional objects are placed upon the belt,

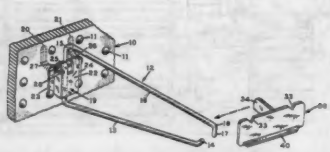
torsion spring means operable to effect automatic rewinding of said belt onto said roller and forward feed of said objects on said belt when the forwardmost object in the column of objects is removed from the belt, and

variable means for adjusting the tension of said torsion spring means to vary the force with which said belt is moved forwardly on the shelf as objects are removed therefrom.

4,351,440
MERCHANDISE HOOK

David R. Thalenfeld, Beechurst, N.Y., assignor to Trion Industries Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 918,483, Jun. 23, 1978, abandoned. This application May 19, 1980, Ser. No. 151,357
Int. Cl.³ A47F 5/00
U.S. Cl. 211—57.1 13 Claims



1. A merchandise hook for mounting on a display panel, which comprises

(a) a continuous wire-like element shaped into a generally U-shaped configuration,

(b) said wire-like element including a lower, outwardly projecting merchandise supporting arm and an upper, outwardly projecting safety arm,

(c) said safety arm extending outwardly beyond the end of said merchandise supporting arm,

(d) guard means extending downward from the end of said safety arm, and having minimum upward projection from the upper limits of said safety arm,

(e) said merchandise supporting arm having an upwardly tilted end extremity terminating inwardly of said guard means,

(f) said wire-like element further including a vertical base portion connecting said merchandise supporting arm and said safety arm, and

(g) lug means on said base portion for engagement with an apertured display panel,

(h) said guard means comprising a plate-like label holder formed of deflectable plastic material carried by the outer end extremity of said safety arm,

(i) said safety arm having an integral, downturned end extremity terminating outward of the end extremity of said supporting arm, and

(j) said guard means comprising in part a plate-like holder carried by said downturned end extremity,

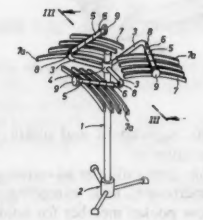
(k) said label holder comprising the forwardmost extremity of said merchandise hook,

(l) said label holder having an integral, wand-supporting flange along its lower portion and a label supporting portion above said flange.

4,351,441
DISPLAY STAND FOR GARMENTS

Werner Schramm, Munich, Fed. Rep. of Germany, assignor to PFP-Anstalt Für Produktentwicklung und Verwertung, Schaan, Liechtenstein

Filed Apr. 15, 1980, Ser. No. 140,595
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916226; Oct. 12, 1979, 2941468
Int. Cl.³ A47F 5/06
U.S. Cl. 211—207 18 Claims



1. A display stand for hanging articles including central support means for providing support for the device, a plurality of support arms having one end secured to said central support means at a first predetermined angle to each other, a carrier rod having one end secured to the other end of each of said plurality of support arms at an angle which, in a horizontal projection, is the complementary angle to 180 degrees of said first predetermined angle, wherein the stand is provided with three support arms and three carrier rods further including stops secured to said central support means to control movement of the hung items wherein said stops include a plurality of flatly formed webs projecting into the space defined between each of said support arms and its associated carrier rod.

4,351,442
CHILD-RESISTANT SAFETY CLOSURE

Kenneth L. Summers, Angola, Ind., assignor to Rieke Corporation, Auburn, Ind.

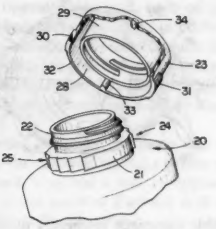
Filed Dec. 17, 1980, Ser. No. 217,409
Int. Cl.³ B65D 55/02
U.S. Cl. 215—216 7 Claims

1. A child-resistant safety closure adapted for threaded receipt by an externally threaded container spout, the safety closure being arranged into a positive-on style and necessitating a two-step release procedure for removal from said container spout, said child-resistant safety closure comprising:

detent means disposed about said externally threaded con-

tainer spout, said detent means including two series of outwardly radiating ratchet teeth, the leading edge of one series being spaced apart from the leading edge of the other series by an angular distance substantially equal to 180 degrees less the angular distance corresponding to one-half of a ratchet tooth; and

a closure cap internally threaded for receipt by said container spout, said closure cap having a side wall which includes two inwardly directed lug means spaced substantially 180 degrees apart and being suitably arranged to provide a positive-on lock with said two series of ratchet teeth when said cap is received by said spout, said lug means providing alternate ratchet tooth engagement with the ratchet teeth of said detent member, said lug means and said ratchet teeth being suitably positioned such that one turn of 180 degrees of said cap is insufficient in order to disengage the positive-on lock of said lug means with said ratchet teeth.

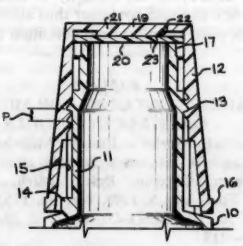


4,351,443

DUAL LIQUID TIGHT CLOSURES

Gerhardt E. Uhlig, 6539 Dorr St., Apt. L20, Toledo, Ohio 43615

Filed May 15, 1981, Ser. No. 264,012
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **20 Claims**



1. In combination:

a container including (1) a principal hollow body serving as a receptacle and (2) a connected upstanding neck terminating in a rim-defined opening and having threads formed on the exterior annular surface of said neck for threaded engagement by cooperating thread means formed on a suitable closure,

a closure member including (1) a top wall spanning said rim-defined opening, said top wall being adapted to sealingly contact said rim, (2) a connected depending skirt adapted to threadingly engage said threads on said neck of said container,

said closure and container each including, in coincident registration with said threads, cooperatively engageable and disengageable lock abutments, and

spacing means for allowing rotational tightening beyond that normally achieving locking engagement of container as would induce distortion or stress in either said closure or container;

means associated with said closure adapted for purposeful dextrous manipulation to effect disengagement of said abutments, and

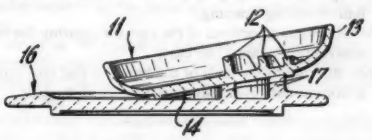
internal forming provisions designedly configurated inside of closure top wall and container top rim defined-opening to draw-form an inserted resilient liner-disc-member sandwiched between said internal forming provisions into a new shape configuration when closure is first time threadingly applied upon container neck, which new shape is individually fashioned and receives downwardly drawn gland surfaces, which surfaces serve as secondary sealing means, said sealing means are functionally under circumferentially embracing pressure by way of individually manufactured new liner component.

4,351,444

BOWL FOR MAINTAINING LIQUIDS AND SOLID FOODS SEPARATE

Edward Majewski, 81 Rae Ave., Staten Island, N.Y. 13102

Filed Nov. 29, 1979, Ser. No. 98,512
Int. Cl.³ B65D *21/02, 25/04;* **A47G** *19/02*
U.S. Cl. 220—20 **5 Claims**



1. A bowl for simultaneously containing solid and liquid edible substances while maintaining said solid and liquid edible substances separate, said bowl comprising

(a) a body portion which has a bottom and at least one side wall for containing said substances within said bowl;

(b) means for tilting said body portion such that the underside of said body portion forms an acute angle with a horizontal plane and said tilting means comprises a plate whose outer diameter is greater than the outside diameter of said bowl, said plate containing a plurality of ridges which are oriented paralled to one another and which increase in length and height as the perimeter of said plate is approached so that said bowl rests on said ridges and inside said plate on which said bowl may be placed; and

(c) at least one ridge attached to the upper side of and extending at least partically across said bottom in such a way as to prevent admixture of said solid and liquid substances when said substances are placed on said upper side of said bottom portion.

4,351,445

BAIL HANGERS FOR PAINT CANS AND THE LIKE

Earl D. Giggard, Clarendon Hills; Nick S. Khoury, Worth; John J. Kowalik, Glenview, and Donald R. Terrien, Naperville, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Sep. 29, 1980, Ser. No. 192,137
Int. Cl.³ B23P *17/00;* **B65D** *25/32*
U.S. Cl. 220—91 **7 Claims**

1. A container having a body including a bottom and an upper edge with an integral outward curl,

a bail,

and means on said curl for pivotally hanging said container from the bail,

and said means on said curl comprising a portion of said curl cut away from said body and offset therefrom to provide a bail-engaging eye structure,

and said portion of said curl having an end separated along a radial cut from the remainder of the curl and being bent in toward the body portion, and means securing said end to the body portion.

4. A method of making bail securements on a container having a body portion and an outturned curl along its upper edge comprising:

forming from material a container having a bottom, a cylindrical body and an outturned curl about the upper edge of the body,

cutting out bail-engaging portions of the curl to provide a bail receiving opening,

then deforming portions of the curl for clearing the bail from obstruction against the curl;

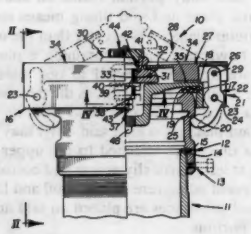
then entering of the ends of the bail into said curl portions to accommodate swinging movements of the bail.

4,351,446

HIGH-SECURITY FILL CAP FOR UNDERGROUND STORAGE TANKS

Michael J. Madden, West Covina, Calif., assignor to Pomeco Corporation, Paramount, Calif.

Filed Jul. 20, 1981, Ser. No. 284,614
Int. Cl.³ B65D *55/14*
U.S. Cl. 220—210 **16 Claims**



1. A high-security fill cap adapted for releasable attachment to a fill pipe of a storage tank comprising

an annular cap adapted for sealing engagement with an open end of said pipe,

latching means movably mounted on said cap for movement between a latched position engaging said pipe and an unlatched position disengaging said pipe,

actuating means for moving said latching means between its latched and unlatched positions in response to movement of said actuating means between lowered and raised positions, respectively, and

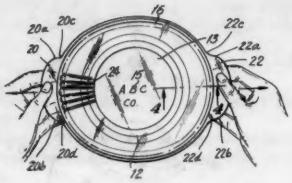
locking means, including a locking lug, for selectively moving said locking lug between a locked position retaining said actuating means in its lowered position and a released position permitting movement of said actuating means to its raised position.

4,351,447

REUSABLE RESILIENTLY DISTORTABLE SHEET PLASTIC CLOSURE FOR APPLICATION TO RIMMED CONTAINERS

Stewart M. Graff, c/o Douglas Stephens Plastics, Inc., 101 E. Main St., Little Falls, N.J. 07424

Filed Jul. 31, 1981, Ser. No. 289,032
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **8 Claims**



1. A reusable one-piece resiliently distortable flexible sheet plastic closure for application to rimmed containers of the same size and of the type in which to store edible goods, comprising:

(A) a crown;

(B) a skirt downwardly dependent from the periphery of the crown and joined thereto by a generously rounded section;

(C) retroverted means on the skirt for detachably and mechanically tightly snappingly locking the closure to the rim of the container by extending under the rim; and

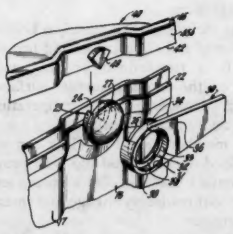
(D) at least one pair of diametrically opposed radially extending pull tabs in one-piece with the closure positioned thereon at the lower edge of the skirt and joined thereto by a generally S-shaped section, said pull tabs capable of diametrically elongatably distorting said closure when pulled radially outwardly by a user to thereby unlock said locking means by radially extending the same to clear the rim and permit removal of said closure from the container without destroying the integrity of said locking means, said closure and said container thus allowing said closure to be reapplied in unimpaired condition to said container.

4,351,448

PACKAGING CONTAINER FOR MINING AND CONSTRUCTION TOOLS

Brian E. Ingersoll, Marietta; Ross C. Nicholson, Stone Mountain, and James W. Dennisson, Atlanta, all of Ga., assignors to General Electric Company, Detroit, Mich.

Filed Aug. 8, 1980, Ser. No. 176,589
Int. Cl.³ B65D *45/04, 21/02, 25/32*
U.S. Cl. 220—318 **10 Claims**



1. A packaging container for tools comprising:

a body portion having an open end portion, a closed base portion, a front wall, a back wall, and a pair of opposed

side walls, said front wall, said back wall and said pair of opposed side walls each including a central recessed portion, the depth of each said central recessed portion decreasing along its length from the open end of the container towards the base portion thereof, said body portion further including a pair of substantially cylindrical cover engagement members, one said cover engagement member being fixedly attached to the central recessed portion of one said side wall and the other cover engagement member being fixedly attached to the central recessed portion of the opposite side wall, each of said cover engagement members including a cutout portion, said body portion further including a pair of handle support members, each of which being fixedly attached to one of said cover engagement members, said front wall of said body portion including at least one tab member fixedly attached thereto;

a cover member for covering the open end of said body portion, said cover member having a planar portion and a front wall, a back wall and a pair of opposed side walls enclosing said planar portion, the back wall of said cover member being hingedly connected to the back wall of said body portion, said cover member including a pair of peg members, one said peg member being fixedly attached to one of said opposed cover side walls and the other said peg member being fixedly attached to the other cover side wall, said peg members being configured and located so as to be receivable in the cutout portions of said body portion cover engagement members when said cover member is closed over said container body, said cover member further including at least one flap member hingedly connected to the front wall of said cover member, each said at least one flap member having an aperture aligned with one of said at least one tab member on said body portion such that each said aperture can resistably engage its associated tab member, said at least one flap member being dimensioned to extend partially over said central recess portion of said front wall when the container cover is closed; and

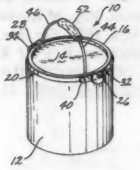
a generally U-shaped handle member having a grip portion and a pair of arm portions, each of said arm portions having an aperture for receiving one of said handle support members, each of said apertures including a reduced diameter portion having a diameter less than that of its associated handle support member and defining an annular wall member within each said aperture, the remaining portion of each said aperture having a diameter greater than that of its associated handle support member, each handle support member being disposed in the portion of greater diameter of its respective handle arm aperture such that said handle may pivot around said handle support members, each of said handle arm portions further including an annular flange member pivotally mounted over one of said handle support members so as to cooperate with the cover engagement member associated with each said one handle support member, each of said annular flange members having a slot portion, such that when said handle member is in a first position, each of said slot portions is substantially aligned with the cutout portion of its associated cover engagement member such that one of said cover peg members may be received in each said cutout portion, and such that when said handle member is pivoted to a second position, each said annular flange member overlies its associated cover engagement cutout portion so as to enclose the respective cover peg member received therein, thus securing said container cover to said container body and enabling the closed container to be carried by said handle, and such that when said handle is pivoted to a third position, said handle engages said at least one tab member securing each said at least one flap on its respective tab member, thereby redundantly locking said cover member to said body portion and securing said container for storing and shipping.

4,351,449

SELF-LOCKING, UNLOCKING DETACHABLE HAND LEVER CAM SEALED CONTAINER

Dwight D. Zobel, 1658 Hyperion, Waterloo, Iowa 50703

Filed May 22, 1981, Ser. No. 266,460
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—318 **6 Claims**



1. A container having a sealable, releaseable and resealable lid comprising:

a vessel including a body wall and a bottom, with the upper portion of said body wall terminating in an integrally formed rim, defining an opening into the vessel, a cover adapted to matingly overlie said rim, having a sealing gasket secured to the cover so as to sealingly engage said rim,

said cover at its opposite sides having downwardly and outwardly extending tabs defining an open cam surface adapted for receipt of a cam lug when said cover is placed on said lid,

mounted to said vessel adjacent to said rim at opposite sides, a pair of bail support brackets, each of which rotatably support a cam shaft having a cam lug movable between lock and unlock positions, with the outer end of said cam shaft having a protruding ear,

a bail pivotally attached to said ear and extending upward for locking engagement into an associated bail handle,

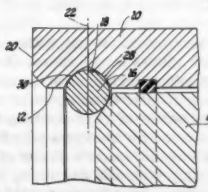
whereby unlocking of said bail handle allows the handle to be pivoted downwardly causing said cam shaft and correspondingly said cam lug to move to the unlock position and exert upward opening force on said cover, and conversely, upward pivoting of said bail responsively moves said cam lug to its lock position, causing downward foce on said cover.

4,351,450

GROOVE STRUCTURE FOR A RETAINING RING

James D. Summerfield, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1981, Ser. No. 271,658
Int. Cl.³ B65D *45/32*
U.S. Cl. 220—319 **3 Claims**



1. A retaining structure for an end cap in a circular opening in a housing comprising; an annular groove in the housing having a centerline defined by the intersection of two opposed surfaces of revolution, each surface of revolution having a radius of curvature with its center axially offset from the centerline towards the opposed surface of revolution, and a locking ring having a circular cross section with a radius less than the radius of either surface of revolution and being disposed in

said annular groove in contact with both surfaces of revolution such that loads imposed on said locking ring by the end cap are supported by both surfaces of said annular groove.

4,351,451

RUBBER SEALED METAL VACUUM BOTTLE AND STOPPER CAPS THEREFOR

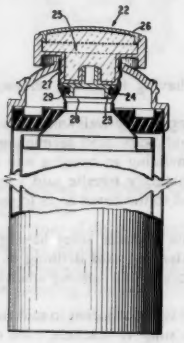
Ha D. Chung, Seoul, Rep. of Korea, assignor to Han Baek Trading Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 6, 1979, Ser. No. 91,866

Claims priority, application Rep. of Korea, Feb. 17, 1979, 890/1979[U]; Feb. 17, 1979, 891/1979[U]

Int. Cl.³ A47J *41/02*; B65D *25/14, 25/18*

U.S. Cl. 220—420 **2 Claims**



2. In combination with a vacuum bottle which includes a filler having a neck portion defining a smooth inwardly tapered throat opening having threading at its outermost portion, a closure assembly for said opening comprising:

a stopper cap having threads thereon to engage the threads of the neck portion of the vacuum bottle;

an O-ring retainer movably connected to the bottom of said stopper cap body; and

a rubber O-ring positioned on the lateral surface of the O-ring retainer,

such that when the stopper cap is threaded into the vacuum bottle, the O-ring engages the tapered throat opening and thus spreads to seal the throat opening of the vacuum bottle as the stopper cap is threaded in.

4,351,452

TURRET CUP SUPPLY AND DELIVERY APPARATUS

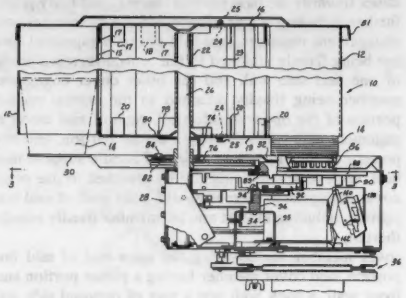
Frank T. Scalera, Maplewood, and Andris C. Sloss, Sussex, both of N.J., assignors to Rowe International, Inc., Whippany, N.J.

Filed Jun. 10, 1980, Ser. No. 158,259

Int. Cl.³ B65H *7/00*; B65G *59/00*

U.S. Cl. 221—11 **9 Claims**

1. A cup supply mechanism for use with a drink machine having a shaft which rotates in the course of each cycle of operation of said machine including in combination a cup dispensing mechanism adapted to be operated to deliver cups one by one from a column of cups positioned in operative relation therewith, a turret for holding a plurality of columns of cups, means mounting said turret with one of said columns, in operative relationship with said dispensing mechanism, an arm, means mounting said arm adjacent to said one column at a predetermined level for pivotal movement between a first position at which said arm is out of said column and a second position at which said arm enters said column in the absence of a cup at said level, means biasing said arm to its second position, a drive slide, means mounting said slide on said arm for reciprocating movement between a retracted position and an extended position, means biasing said slide to said retracted position, respective first and second elements on said shaft and on said slide, said elements adapted to clear each other in the course of rotation of said shaft in the first position of said arm and to engage in the course of rotation of said shaft in the second position of said arm to move said slide to its extended



position, and means responsive to movement of said slide to its extended position for moving said turret to position another column in operative relationship with said dispensing mechanism.

4,351,453

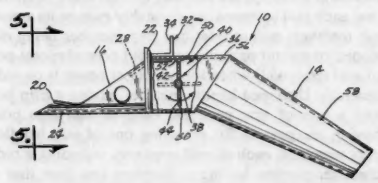
OIL SPOUT WITH VALVE

Alan E. Walker, 1124 Parc Dr., Papillion, Nebr. 68046

Filed Oct. 17, 1980, Ser. No. 197,920

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83.5 **3 Claims**



1. In an apparatus for pouring oil from oil cans, said apparatus including an elongated generally tubular spout having a can piercing blade extended from one end thereof such that upon insertion of said blade into the top of an oil can, oil may be poured from the can through said spout upon inversion of the can, the improvement comprising a valve,

means for supporting said valve interiorly of said spout for movement between a closed position wherein said valve is oriented transversely of said spout to substantially retard oil flow through said spout and an open position wherein said valve is oriented generally perpendicularly to said closed position whereby oil flow through said spout is substantially unimpeded, and

means connected to said valve and positioned exteriorly of said spout for moving said valve between said closed and open positions,

said valve comprising a butterfly valve including a pivot rod extended through said spout and pivotally supported thereon, and a valve plate secured to said rod interiorly of said spout for pivotal movement therewith,

said means for moving said valve between said closed and open positions comprising a handle secured to one end of said rod in response to pivotal movement of said handle,

said handle being an elongated member directed generally parallel to said valve plate whereby the pivotal position of said handle provides an indication of the position of said valve plate,

said valve being of a size and shape relative to said spout such that when said valve is in the closed position, a slight peripheral clearance is provided between the exterior periphery of said valve and the interior periphery of said spout,

said spout including a generally enlarged neck portion at one end thereof, said can piercing blade being connected to said neck portion and extended generally axially therefrom, and said valve being pivotally supported within said neck portion,

an arcuate shield member arranged in close association to said blade and connected to said spout whereby said shield member is operative to direct oil flow into said spout from an oil can pierced by said blade, and

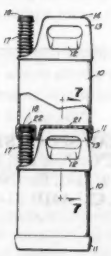
said spout being of compact rigid construction such that upon insertion of said can piercing blade into the top of an oil can and insertion of the opposite end of the spout into an oil filler opening, said can is positioned closely adjacent said opening.

4,351,454

LIQUID CONTAINER HAVING STACKING FEATURE

Walter P. Maynard, Jr., Suite 236, 3070 Presidential Dr., Atlanta, Ga. 30340

Filed Jul. 16, 1980, Ser. No. 169,300
Int. Cl.³ B67D *5/60*; B65D *21/02*
U.S. Cl. 222—143 **4 Claims**



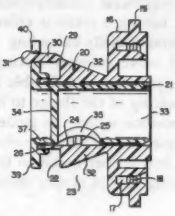
1. A liquid container formed as a unit from plastics material comprising a body portion having a bottom surface, a gabled upper surface, a hollow top carrying handle on said body portion which surmounts said gabled upper surface, a pouring and filling nozzle integrally formed on the top of said body portion and having a sufficiently large interior diameter to be self-venting and to facilitate filling the container through said nozzle, said nozzle being flexible along its length, and a removable closure means for said nozzle so that when said nozzle is upright, the top of said closure means is flush with the top of said handle, said top of said handle and said top of said closure means forming a surface to promote stacking the container with other like containers, said handle having flat, opposite side faces upwardly converging in symmetrical relationship from said body portion and terminating to said top of said handle, said side faces and said top defining a manual grasping aperture and said bottom surface having a longitudinally extending, arcuate-shaped depressed area with opposed side edges and including a manipulating recess on the lower end of said container adjacent said bottom surface and including a main recess in the bottom of said container and a secondary recess in said bottom surface forwardly of said main recess, said main and secondary recesses adapted to receive the upper portion of said handle and the top of the flexible nozzle of an underlying container when two containers are stacked while said nozzle is upright.

4,351,455

FINGER-ACTUATED SLIDEABLE DISPENSING VALVE

Curtis J. Bond, Marion, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Filed Jun. 19, 1980, Ser. No. 160,981
Int. Cl.³ B65D *25/40*
U.S. Cl. 222—153 **4 Claims**



1. A dispensing valve assembly adapted to be removably mounted on a spout carried by a flexible bag which is intended for disposition in a box for movement of the valve assembly between a non-dispensing position and a dispensing position locked in an opening in a wall of the box comprising: a cap having a body of substantially disc-like form with means for removably mounting it on the spout, an annular tubular guide sleeve formed concentrically on the disc-like body and projecting axially outwardly therefrom substantially nornal thereto, said guide sleeve being of less diameter than the disc-like cap body and having a cylindrical socket extending completely therethrough and through the cap body, a peripheral radially-extending flange spaced axially-inwardly of the outer end of said guide sleeve to provide an axially-outwardly extending annular flexible sealing skirt with an outer extremity, said peripheral flange being spaced axially-outwardly from the disc-like cap body to provide an annular finger-receiving space therebetween; an annular tubular slide valve member mounted for axially sliding and rotating movement in said guide sleeve and being of hollow form to provide a dispensing passage with an open axial inner end, an outer transverse wall closing said dispensing passage adjacent an outer extremity of the valve member but spaced therefrom to provide an outwardly-extending annular inner skirt at said outer extremity, a peripheral radially-outwardly extending flange on said outer extremity of said valve member, said last-named flange having an inwardly-extending annular outer skirt which is concentric with said outwardly-extending inner skirt to form an inwardly-opening annular sealing groove for receiving said flexible outwardly-extending sealing skirt on the guide sleeve when the valve member moves axially inwardly on the guide sleeve into closed position as determined by said extremity of the sealing skirt contacting said peripheral flange on the valve member in the groove, interengaging stop means between the valve member and the guide sleeve to limit axial outward sliding movement of the valve member relative to said sleeve into opened position, said peripheral flange on the outer extremity of said valve member extending radially outwardly thereof over the said peripheral flange on the guide sleeve and being spaced axially-outwardly thereof when the valve member is in its inner closed position on the guide sleeve to provide a finger-receiving space between the two flanges, said valve member having a dispensing port leading radially therefrom just axially inwardly of said transverse wall which is axially within the guide sleeve when the valve member is in closed position but is axially beyond the guide sleeve when the valve member is in opened position as determined by said stop means; said interengaging stop means comprising an annular stop shoulder on the exterior surface of the tubular valve member at its inner extremity and a cooperating annular stop shoulder on the inner surface of said guide sleeve axially adjacent said radially-extending peripheral flange on said guide sleeve so as to position the dispensing port of the valve member beyond the outer extremity of the flexible

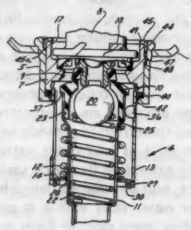
sealing skirt of the guide sleeve when the said stop shoulders are engaged; an annular sealing shoulder on the inner surface of said annular flexible sealing skirt of the guide sleeve for engaging with the adjacent outer surface of said inner skirt of the valve member when the valve member is moved axially inwardly of the guide sleeve into closed position with said flexible sealing skirt extended axially outwardly into said annular sealing groove; a latch tab having an inner end flexibly secured to said peripheral radially-extending flange on the guide sleeve and having a retainer enlargement on its outer end; said peripheral radially-extending flange on the outer extremity of said valve member having a radially-directed keeper notch for receiving said flexible tab with the retainer enlargement outwardly of the flange to hold said valve member in its closed position within the guide sleeve, said dispensing port being formed in said valve member at a point diametrically-opposed to said keeper notch so the latch tab will also locate the dispensing port in proper dispensing position angularly.

4,351,456

VALVED KEG CLOSURE

James E. Nezworski, Waukesha, Wis., assignor to The Perlick Company, Inc., Milwaukee, Wis.

Filed Oct. 14, 1980, Ser. No. 196,645
Int. Cl.³ B67D *1/04*
U.S. Cl. 222—400.7 **9 Claims**



1. A keg closure for cooperation with a removable tapping coupler, comprising a relatively fixed substantially cylindrical element which is securable in a keg wall aperture and which defines a coaxial annular valve seat, a relatively fixed tubular element coaxially secured at a top end portion thereof to said cylindrical element and projecting downward therefrom, and an axially movable tube member coaxially received in said tubular element with substantial radial clearance and having an upper end at which there is a valve element, said tube member being substantially longer than said tubular element to have its lower end near the bottom of a keg in which the closure is installed and being biased upward for normal engagement of said valve element with said valve seat, said keg closure being characterized by:

A. a portion of said tube member that is surrounded by said tubular element being of substantially uniform diameter along its length; and

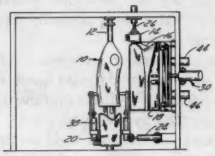
B. said tubular element having integral, circumferentially spaced, radially inwardly bent tabs intermediate its top and bottom ends that slidingly engage said portion of the tube member to confine the same to axial up and down motion.

4,351,457

JACKET PRESSING APPARATUS

Wilhelm Engelbart, Boras, Sweden, assignor to Maskinfirma Certus AB, Ganghester, Sweden

Filed Jul. 11, 1980, Ser. No. 167,654
Int. Cl.³ D06C *15/00*
U.S. Cl. 223—57 **2 Claims**



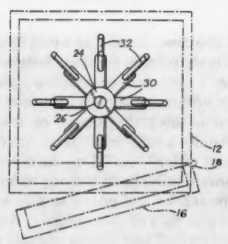
1. In a pressing apparatus which includes means for pressing the side and sleeves of a jacket, the improvement wherein the apparatus includes a body shaped buck adapted to receive at least a side half of the jacket, a combined side pressing head and sleeve buck, means for moving said combined head and buck upwardly from a first position to a position interposed between the side and sleeve of the jacket, means for moving the combined head and buck inwardly and slightly downwardly against a side of the jacket in a pressing relationship thereto, and pressing means adapted to move into and out of a pressing relationship with the sleeve of the jacket and the sleeve buck.

4,351,458

ROTARY THREAD SPOOL STORAGE TREE

Jack L. Wolfe, 13314 SE. Oatfield Rd., Milwaukie, Oreg. 97222

Filed Feb. 9, 1981, Ser. No. 232,563
Int. Cl.³ A41H *31/00*
U.S. Cl. 223—106 **7 Claims**



1. A thread spool storage tree, comprising:

(a) a base,

(b) an elongated, vertically extending post member mounted on said base,

(c) outwardly projecting limb members arranged along the length of the post member in longitudinally spaced groups each of a plurality of limb members disposed at circumferentially spaced intervals around said post, and

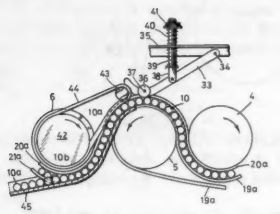
(d) an upwardly and outwardly extending spool holding arm member supported on each said limb member,

(e) the arm and limb members being arranged on the post to allow installation and removal of each spool without interference from spools on adjacent arm and limb members.

4,351,459
AUTOMATIC GLASS TUBE CUTTER

Perng Huey-Miin, No. 35, 1st St., Fu Kuei New Village Tou-Chung Li, Chu-Tung Town, Hsin-chun Hsien, Taiwan

Filed Nov. 26, 1980, Ser. No. 210,737
Int. Cl.³ C03B *33/06*
U.S. Cl. 225—96.5 4 Claims



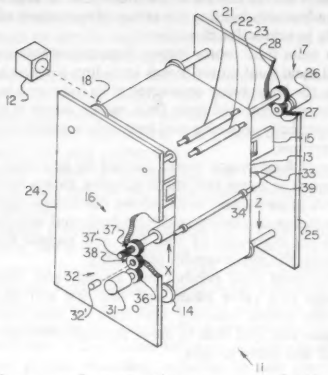
1. A device for cutting long rod, or tubular products, particularly glass tubes comprising:
- a feeding device, including,
- a gate at an outlet of a feeding table for controlling the outlet quantity of tubes from said feeding table;
- a feeding plate which has a slope to guide the material from said feeding table;
- a loading wheel which has a plurality of openings around its periphery; by means of its rotation, tubes falling into said openings are sent to a narrow path;
- a scraping plate to scrape away the tubes on said loading wheel and
- a narrow path between said loading wheel and an inlet of a conveyor system which allows passing of only a piece of tube so that the feeding is in a row of tubes falling into said conveyor system one by one;
- a conveyor system which causes a wave-like transversal conveying of the tubes, and has a width which becomes smaller and smaller gradually following a sequence of cuttings;
- a plurality of cutter pairs, each pair of which are installed at two sides of said conveyor system and the distance between said pair of cutters is adjusted upon the length of material to be finished; and
- a collection path, installed in front of each said cutter for collecting said cut tubes and then conveyed to a certain place for packing or processing.

4,351,460
TRANSPORT SYSTEM FOR PHOTO-TYPESETTING MACHINE

Alfred R. Ouellette, Saugus, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jun. 16, 1980, Ser. No. 159,428
Int. Cl.³ B65H *23/18, 17/18*
U.S. Cl. 226—25 11 Claims

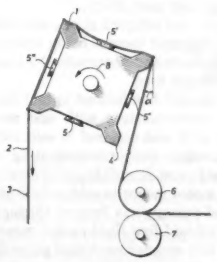
1. a flexible sheet transport and tensioning system comprising:
- primary drive means for feeding the flexible sheet at a predetermined velocity in either a forward or a reverse direction; tension roller means disposed in the path of the flexible sheet so as to be frictionally engaged thereby;
- auxiliary drive means; and,
- coupling means coupled between said tension roller means an said auxiliary drive means and driven thereby in a given sense that tends to produce rotation of said tension roller means in a direction to move the flexible sheet in said reverse direction, and wherein said coupling means comprises a slip coupling adapted to slip in response to application of a given torque of said tension roller in said forward direction and unidirectional coupling means for preventing movement of said auxiliary drive means in a sense opposite to said given sense.



4,351,461
METHOD AND AN ARRANGEMENT FOR THE FEED OF A MATERIAL WEB

Lars Carlsson, Blentarp, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Dec. 5, 1980, Ser. No. 213,470
Claims priority, application Sweden, Dec. 11, 1979, 7910167
Int. Cl.³ B65H *23/18;* G03B *1/18*
U.S. Cl. 226—28 6 Claims



1. A method for feeding a web containing transverse crease lines in which a rotary driver contains edges spaced around its periphery which are arranged to drivingly engage the crease lines, the improvement comprising the step of temporarily bending that part of the web disposed between two of said edges to urge the respective crease lines into engagement with said two edges.

4,351,462
PNEUMATIC FEEDER FOR PUNCH PRESSES AND THE LIKE

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Jan. 9, 1981, Ser. No. 223,786
Int. Cl.³ B65H *17/36, 17/44*
U.S. Cl. 226—150 1 Claim

1. In a pneumatically operated feeder for intermittently advancing stock into the work station of a punch press or the like and having a main body;
- rail means extending from said body;
- a feed slide mounted on said rail means for reciprocating movement in feed and index directions;

stock gripping means carried by said feed slide and being adapted to be moved between stock gripping and stock release conditions;

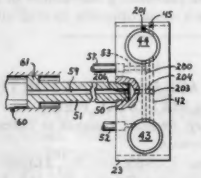
abutment means carried at the outer end of said rail means for adjustably limiting the extent of movement of said feed slide in said index direction;

a first main fluid motor means disposed in said main body, said main fluid motor means including a piston and piston rod, the latter being connected at its outer end to said feed slide whereby said main fluid motor means is capable of reciprocally actuating said feed slide in said feed and index directions;

a second fluid motor means carried by said feed slide and adapted to move said stock gripping means between said stock gripping and stock release conditions; and

valve means carried by said main body and adapted to control the operation of said first and second fluid motor means: the improvement conprising

an improved fluid conduit line arrangement disposed between said valve means and said first and second fluid motor means whereby operation of said valve means causes said feed slide to move through alternate operative feed and index strokes;



said improved conduit line arrangement including a first air conduit line extending from the output of said valve means and through said main body;

a straight rigid tube coupled at one end thereof to said feed slide, the other end thereof being telescopically received by said main body and pneumatically communicating with said first conduit line;

a second air conduit line formed in said feed slide and pneumatically communicating with said second fluid motor means and with said one end of said tube; and

a third air conduit line communicating with said second conduit line in said feed slide and with the head end of said main fluid motor means in said main body and including a longitudinal passageway formed through said piston and piston rod of said first fluid motor means;

said conduit line arrangement thus providing a roundabout circuitous path of flow for the air conducted between said valve means and said head end of said main fluid motor means in said main body, which path requires such air to flow serially through said main body, rigid tube, feed slide, piston rod and piston which in turn promotes in said feeder a short time delay between the respective initiations of operation of said second fluid motor means and said first fluid motor means.

4,351,463

DEVICE FOR FEEDING WEB-SHAPED PACKAGING MATERIAL

Siegfried H. Knecht, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Jan. 5, 1981, Ser. No. 222,286

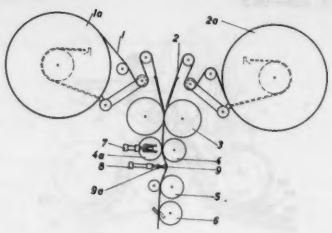
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002092

Int. Cl.³ B65H *17/22, 75/02*

U.S. Cl. 226—154 **5 Claims**

1. In a spool changing device for alternately feeding web-shaped packaging material from two supply spools to a packaging machine by way of a common conveying track along which a pair of engraving rollers, a pair of conveying rollers, and a cutting device are sequentially positioned, the improvement comprising:

auxiliary drive means mechanically associated with said engraving rollers and operable to vary the distance be-



tween the axes of said engraving rollers, whereby said engraving rollers may be moved apart by said auxiliary drive means to a position wherein conveying takes place without embossing when the leading end of packaging material arrives from a new spool.

4,351,464

COMPRESSED AIR-OPERATED FASTENER DRIVING TOOL WITH RELEASE SAFETY MEANS

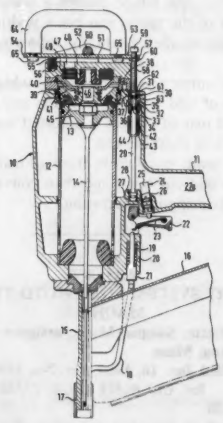
Hellmuth Fehrs, Hamburg, and Wolfgang Elliesen, Ahrensburg, both of Fed. Rep. of Germany, assignors to Joh.Friedrich Behrens AG, Ahrensburg, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 155,947

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014803

Int. Cl.³ B27F *7/02, 7/34*

U.S. Cl. 227—7 **10 Claims**



1. Compressed air-operated fastener driving tool comprising a pilot valve controlled by a manually operated release lever, a control valve the pressure bias of which is controlled by the pilot valve and which for its part control the supply of compressed air to a working cylinder, and a release barrier actuated by the workpiece by means of which in common with the release lever placed in the working position the actuation of the pilot valve is adapted to be controlled; and in addition to said pilot valve and control valve a third manually operable release organ movably fitted at the fastener driving tool casing outside the gripping region of the operator's hand actuating the

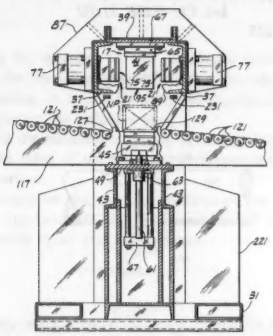
release lever which is effective on a movable valve element of the pilot valve via an opening in the fastener driving tool casing in such a manner that the pilot valve is capable of being moved into the working position only if the other hand of the operator actuates the third release organ, said third release organ being a lever pivotally supported at the fastener driving tool casing which with the aid of a projection over the casing opening is effective on the valve element of the pilot valve and with the aid of a spring is constantly urged in a direction towards the valve element, the force of the spring being greater than the actuating force at the valve element of the pilot valve.

4,351,465

APPARATUS FOR END-PLATING RAILROAD TIES

Walter G. Moehlenpah, Ladue, and Gordon E. Matlock, Sullivan, both of Mo., assignors to Moehlenpah Industries, Inc., St. Louis, Mo.

Filed Sep. 11, 1980, Ser. No. 186,255
Int. Cl.³ B25C *7/00*
U.S. Cl. 227—7 **28 Claims**



1. Apparatus for pressing nailing plates into opposite ends of elongate members, such as wooden railroad ties, thereby to end-plate the ties, comprising a press having upper and lower platen means engageable with the top and bottom faces of a tie adjacent the ends thereof, said lower platen means being movable through an upstroke for raising the tie while generally horizontal from a lowered position to an elevated position and for pressing the tie against said upper platen means thereby to apply a vertical compressing force to the tie adjacent the ends thereof, and a downstroke for lowering the tie, side platen means engageable with opposite side faces of said tie adjacent the ends thereof when the tie is in said elevated position, said side platen means being movable toward and away from one another whereby a horizontal compressing force can be applied to and removed from the opposite side faces of the tie adjacent the ends thereof, and a pair of end platens engagable with nailing plates on opposite ends of the tie for pressing the plates into the tie ends when the tie is in said elevated position and while said compressing forces are being applied to the tie by said upper, said lower and said side platen means.

4,351,466

DISPOSABLE INSTRUMENT FOR SURGICAL FASTENING

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 16, 1980, Ser. No. 197,614
Int. Cl.³ A61B *17/04, 17/11*
U.S. Cl. 227—8 **6 Claims**

1. A surgical fastening instrument which comprises:

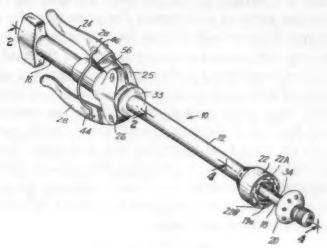
(a) a tubular housing having an axial bore and an axial slot which extends through its tubular wall;

(b) a tubular pusher axially located within the bore of said housing and adapted to move distally and proximally within the bore; said pusher having an axial slot extending through its tubular wall; said pusher slot being angularly aligned with said housing slot;

(c) a central rod axially located within said pusher and adapted to move distally and proximally within said pusher; said central rod having an axial groove in its lateral surface; said central rod groove being angularly aligned with said pusher slot;

(d) means, located at the proximal end of said housing, for moving said central rod distally and proximally within said pusher;

(e) a handle pivotally mounted on the tubular wall of said housing; the pivotal mounting of said handle being laterally spaced from the tubular wall of said housing; a first part of said handle being located on the side of the pivotal mounting remote from said housing and being adapted to move about the pivotal mounting towards said housing; a second part of said handle being located on the other side of the pivotal mounting, adjacent to said housing, and being positioned within the slot in said housing and within the slot in said pusher; the second part of said handle being adapted to move distally against the distal end of the slot in said pusher to move said pusher distally within the bore of said housing upon movement of the first part of said handle towards said housing; the end of the second part of



said handle, remote from the pivotal mounting, being spaced from the pivotal mounting by a distance greater than the lateral distance between the pivotal mounting and the lateral surface of said central rod;

(f) an anvil mounted in a predetermined indexed orientation on the distal end of said central rod;

(g) a staple carrying assembly mounted in a predetermined indexed orientation on the distal end of said housing between said anvil and the distal end of said pusher; said staple carrying assembly being activated by distal movement of said pusher against the proximal end of said staple carrying assembly, so that staples are urged distally against said anvil; and

(h) means for determining that the axial position of the distal end of said central rod relative to the distal end of said housing is such that said anvil and said staple carrying member are properly spaced apart for fastening tissue between them;

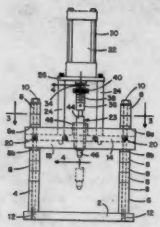
the groove in said central rod being located, so that when said anvil and said staple carrying assembly are properly spaced apart for fastening tissue between them: (1) at least a portion of the slot in said pusher is laterally aligned with at least a portion of the groove in said central rod; and (2) the end of the second part of said handle, remote from the pivotal mounting, can move medially and distally into the groove in said central rod and the second part of said handle can move distally against the distal end of the slot in said pusher to move said pusher distally within the bore of said housing

against the proximal end of said staple carrying assembly to activate said staple carrying assembly.

4,351,467
PIN CHUCK PRESS

William P. White, c/o Mechanical Application, Inc., Wiscasset, Me. 04578

Filed Apr. 7, 1980, Ser. No. 138,003
Int. Cl.³ H05K 13/04; B33B 49/00
U.S. Cl. 227—142 4 Claims



1. In a machine for driving a pin into a hole of cooperating size in a work piece mounted on a base and in which the machine comprises a fluid cylinder with a piston for moving a pin chuck on the end thereof in rectilinear motion with respect to said base on which said cylinder is mounted,

the means for mounting said cylinder on said base comprising a cylinder support and means for adjusting the distance of said support from said base in fixed increments which increments are not greater than the stroke of the said piston,

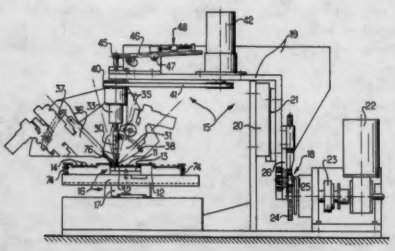
said support comprising a plate and the means for adjusting the position of said plate comprising a plurality of posts mounted on said base, each post formed of tubular spacers held together by a rod passing therethrough with two adjacent spacers on each post clamping the said plate therebetween,

and infinitely adjustable means attached to said piston adapted to engage an element fixed with respect to said support thereby to control the extent of the stroke of said piston and the chuck toward said base.

4,351,468
APPARATUS FOR WIRING CONNECTIONS ON A SUBSTRATE

Claude P. Floury; Claude L. J. M. Guillet, both of Angers; James A. Lokocki, Montreuil Juigne; Maurice R. Devoille, Rochefort Sur Loire, and Bernard Fanene, Prelaze, all of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Sep. 17, 1980, Ser. No. 188,020
Claims priority, application France, Sep. 28, 1979, 79 24290
Int. Cl.³ B23K 1/00
U.S. Cl. 228—4.5 33 Claims

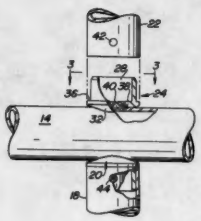


1. Apparatus for wiring on the surface of a substrate comprising a tool carrier, a substrate carrier, means for positioning the substrate carrier in a substantially horizontal plane so it is situated opposite the tool carrier, means for displacing the substrate carrier relative to the tool carrier so the tool carrier is displaceable relative to a vertical plane, a heating element and an electric wire dispenser carried by the tool carrier, said dispenser including a wire outlet orifice situated close to an end of the heating element, means for translating the heating element longitudinally within a sleeve having an axis directed towards the substrate carrier, and a rotary support for carrying the dispenser, said rotary support being rotatable around the sleeve axis to allow the said wire outlet orifice to be positioned with respect to an end of the heating element as a function of the direction of the relative displacement between the substrate carrier and tool carrier.

4,351,469
METHOD OF MAKING RAILING

Don Newman, Philadelphia, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Division of Ser. No. 938,567, Aug. 31, 1978, Pat. No. 4,238,117.
This application Dec. 3, 1979, Ser. No. 99,690
Int. Cl.³ B23K 31/02
U.S. Cl. 228—135 7 Claims



1. A method of making a railing including the steps of:

(a) providing a horizontal rail member and a vertical post member;

(b) providing a hollow one-piece fitting which is open at one end and having an end face at its other end shaped to mate with said rail member, shaping said fitting outer surface so that the outer surface converges toward said end face; positioning said fitting end face in contact with said rail member;

(c) welding said fitting and face to said rail member by introducing a portion of welding apparatus through said fitting so as to provide a weld exposed only through said open end of said fitting;

(d) telescoping one end portion of the post member with respect to said open end of said fitting and then fixedly securing the same together.

4,351,470
METHOD OF MAKING A STIFFENED PANEL

Martin H. Mansbridge, of Filton, England, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 78,582, Sep. 21, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,610
Claims priority, application United Kingdom, Sep. 29, 1978, 38659/78
Int. Cl.³ B23K 28/02; B21D 26/02
U.S. Cl. 228—157 2 Claims

1. In the method of making a stiffening panel which includes the steps of:

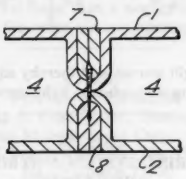
positioning in face-to-face relation two metal sheets at least one of which is superplastically deformable,

attaching the sheets together along at least one line and

about their peripheries to form at least one inflatable envelope; and

inflating the envelope in a mold to superplastically deform the superplastically deformable sheet to form at least two cavities between the sheets separated by wall portions attached to each other along the attaching line, the improvement comprising the further steps of:

prior to the inflating step positioning a plastically deformable metal sheet reinforcing member against the outer surface of the plastically deformable sheet and along the line of attachment of the two sheets;



attaching the member to the plastically deformable sheet along the line of attachment of the two sheets, whereby the member is deformed with the plastically deformable sheet during the inflating step;

continuing the inflating step until portions of the member on opposite sides of the line of attachment meet in face-to-face relation;

bonding together the meeting portions of the member; and

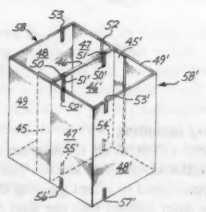
bonding together the opposed portions of the plastically deformable sheet and the member.

4,351,471

DUAL CELL LAMINATED CONTAINER

George H. Dunkle, Locust, N.C., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 27, 1981, Ser. No. 228,862
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—15 **8 Claims**



1. A rectangular cell for a container

said cell having first, second, third and fourth side walls hingedly joined together,

a first series of slots in one end edge of said cell comprising

a first and a second slot spaced from each other a first distance in said first wall,

said second slot being spaced from the adjacent side edge of said first wall a second distance,

a third slot on said second wall adjacent said side edge of said first wall and spaced from said first wall adjacent side edge said second distance, and

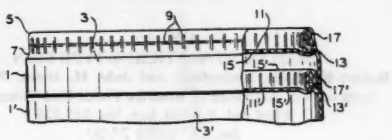
a fourth slot circumferentially spaced from said third slot said first distance and located on the side of said third slot opposite said second slot.

4,351,472

CLOSURE

William R. Eddy, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 822,777, Aug. 8, 1977, abandoned. This application Jul. 1, 1980, Ser. No. 164,875
Int. Cl.³ B65D *5/64, 21/02, 43/03, 43/08*
U.S. Cl. 229—43 **8 Claims**



1. A two-piece paper product closure comprising:

(a) a skirt portion surmounted by an upstanding flange portion comprising an integral extended part, at least, in the shape of an inverted U and

(b) a disc portion having an, at least, upward projection at the periphery of the disc said projection substantially confined between the integral extended part of the upstanding flange portion,

said upstanding flange portion confining the projection swaged to offset the flange portion radially inwardly from the skirt portion at a point between the base of the skirt portion and the top of the flange portion, said offsetting forming a shoulder sufficiently wide to accommodate a duplicate skirt portion stacked thereon and said offset, upstanding flange imprinted at intervals on its outer surface with a crimp design and imprinted at sufficiently closer intervals on its inner surface with a crimp design to take up substantially all excess material from the swaging, said crimp design oriented to provide sufficient entry of air between closures when stacked thereby facilitating automatic destacking.

4,351,473

TRAY CONTAINER WITH TEAR OUT COVER

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Nov. 17, 1980, Ser. No. 207,682
Int. Cl.³ B65D *5/64, 5/54*
U.S. Cl. 229—43 **6 Claims**

1. In a tray type container for packaging a product which is formed from a relatively light weight paperboard material with peripheral side walls upstanding from a bottom wall which side walls will buckle when subject to outwardly directed force and which have an outwardly directed narrow flange formation at the top edge thereof, a top cover forming lid member which has a periphery corresponding substantially to the outer periphery of the narrow flange formation, said cover forming member having a seal forming coating at least around the marginal portions which permits adhesively securing the marginal portions on the top face of the flange formation and said cover forming member having parallel spaced

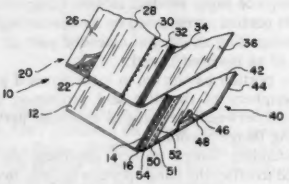
tearing line formations on the outer and inner faces extending around at least a major portion of the peripheral margin, the outermost tearing line formation being spaced from the peripheral edge a predetermined distance which is somewhat less that the width of said flange formation and the innermost tearing line extending adjacent the junction of the inner edge of the flange formation with the top edge of the side wall.

4,351,474

MAILER WITH STICKER-TYPE SIGN

Robert Kaelblein, Springfield, and John H. Jones, Westfield, both of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Jul. 3, 1980, Ser. No. 165,726
Int. Cl.³ B65D *27/00*
U.S. Cl. 229—68 R **4 Claims**



1. A mailer for sticker-type signs, comprising:
(a) a rectangular mailer envelope having two panels folded along a common fold line to form the envelope bottom edge and the two adjacent side envelope edges being held together by glue strips,
(b) one of the panels being wider than the other and having a flap section containing a strip of remoistenable glue,
(c) an elongated thin envelope retaining section disposed immediately adjacent the envelope flap section,
(d) a perforated line disposed between the envelope retaining section and the envelope flap section which permits the envelope to be separated from the envelope retaining section,
(e) an elongated sticker-retaining strip integrally connected to the envelope retaining section,
(f) a rectangular sticker disposed immediately adjacent the sticker-retaining strip,
(g) a perforated line disposed between the sticker-retaining strip and the sticker which permits the sticker to be separated from the sticker-retaining strip,
(h) the sticker having printing disposed on one side thereof and backing adhesive on the other, and
(i) a peel-off strip covering the backing adhesive on the sticker panel.

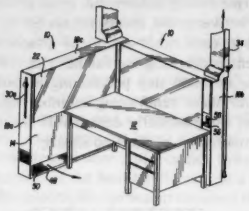
4,351,475

ENVIRONMENTAL CONTROL ROOM DIVIDERS

James W. Hudson, P.O. Box 399, Spotsylvania, Va. 22553

Filed Jun. 24, 1980, Ser. No. 162,550
Int. Cl.³ F24F *7/00*
U.S. Cl. 237—46 **30 Claims**

1. A portable wall-like room divider for resting on the floor and rising to a height of at least three feet, said wall-like room divider having a front facing, a rear facing, and edge members forming a light-source cavity therein wherein an upper portion of said front facing is formed of a light transmissive material, and wherein a light source is positioned inside said light-source cavity for producing light to be transmitted through said light-transmissive material, an adjusting means linked with said light source, but being external of said light-source cavity for adjusting, from outside said light-source cavity, the position of a



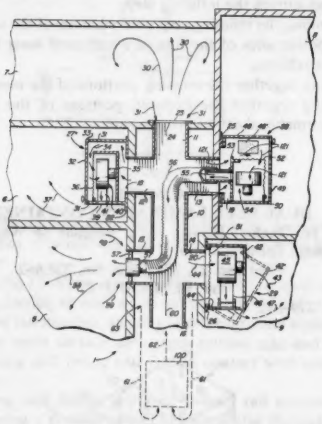
member of said light source, and thereby adjusting the pattern of said light passing through said light-transmissive member.

4,351,476

AIR FILTERING SYSTEM AND METHOD OF OPERATION

William E. Rood, Jr., 1195 S. Idaho Rd., Apache Junction, Ariz. 85220

Filed Nov. 20, 1980, Ser. No. 208,701
Int. Cl.³ F24D *5/04;* B01D *46/42;* F24F *3/16*
U.S. Cl. 237—50 **15 Claims**



1. In a building including
i. a first room and a central air circulation duct system,
ii. a first duct outlet connected to said central air circulation duct system positioned to effect guiding of air in said central air circulation duct system into the first room, and
iii. a main blower connected to said central air circulation duct system for forcing air through said central air circulation duct system,
and an air filtering device comprising in combination:
a. an electric blower having an air inlet and an air outlet;
b. housing means supporting said electric blower and having means for defining a path for air flow from said first duct outlet to said air inlet of said electric blower, said housing means having an air outlet in communication with said air outlet of said electric blower to cause air passing through said electric blower to be blown into said first room; and
c. first filtering means disposed in said housing means between said first duct outlet and said air inlet of said electric blower for filtering all of the air passing into said air inlet of said electric blower.

12. A method of providing a flow of filtered air into a room

of a building, said building having a central air circulation system including a main duct, said method comprising the steps of:

a. steadily drawing unfiltered air only from the main duct of said central air circulation system in the building through a filter by means of an electric blower, regardless of whether the main blower for circulating air through said central air circulation system is operating;

b. preventing any unfiltered air from flowing through the main duct of said central air circulation system directly into the room; and

c. forcing enough of said unfiltered air through said filter into the room to increase the relative pressure in the room to a level such that no more than a negligible amount of unfiltered air enters the room via any openings into the room.

4,351,477

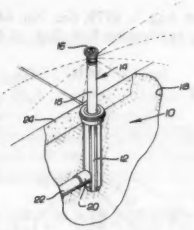
POP-UP SPRINKLER

Mansam Choi, 922 S. Cabrillo Dr., Duarte, Calif. 91010, assignor to Anthony Manufacturing Corporation, Azusa, Calif.

Filed Aug. 4, 1980, Ser. No. 175,121

Int. Cl.³ B05B *15/10*

U.S. Cl. 239—205 **23 Claims**



8. A pop-up sprinkler, comprising:

a housing including an inlet for receiving water under pressure;

a spray nozzle assembly mounted with respect to said housing for vertical sliding movement between a retracted position generally within said housing and an elevated position with its upper end elevated above said housing; and

means within said housing and movable with said assembly for permitting substantially full circle rotation of said assembly with respect to said housing throughout at least a portion of the vertical movement of said assembly below said elevated position to permit adjustment of said assembly to a selected rotational position, and for grippingly engaging said assembly when said assembly is in said elevated position for locking said assembly in said selected rotational position.

4,351,478

APPARATUS FOR CLEANING TANKS OR VESSELS

Bruce T. Looper, 405 48th St., N.W., Bradenton, Fla. 33529

Filed Aug. 18, 1980, Ser. No. 179,094

Int. Cl.³ B08B *9/08*

U.S. Cl. 239—227 **10 Claims**

1. An apparatus for cleaning tanks or vessels, comprising:

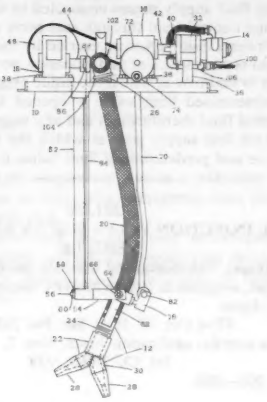
(a) a support frame having an air motor, a first gear box and a second gear box mounted thereon;

(b) an elongated vertical member for insertion through the access opening of the tank or vessel to be cleaned, said elongated vertical member having its upper end attached to said support frame;

(c) a wash nozzle assembly pivotedly attached to the lower end of said elongated vertical member for movement in two directions;

(d) a flexible coupling to operatively connect said air motor and said first gear box;

(e) a belt and pulley mechanism for operatively connecting said first gear box and said second gear box;



(f) a lever arm mechanism for operatively connecting said first gear box and said wash nozzle assembly; and

(g) a lever arm mechanism for operatively connecting said second gear box and said wash nozzle assembly.

4,351,479

JET ENGINE WITH A THRUST VECTOR CONTROL

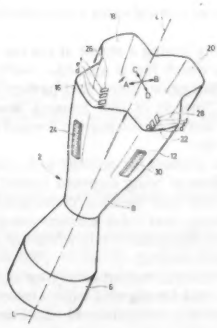
Walter Kranz, Taufkirchen, and Heinz Tillmann, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,428

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922576

Int. Cl.³ B64C *15/10*

U.S. Cl. 239—265.23 **11 Claims**



1. A jet engine comprising:

a housing defining a combustion chamber for generating expanding gases;

a thrust nozzle mounted downstream of said combustion chamber having a constricted neck portion and an adjacent diverging nozzle section widening outwardly from said neck portion;

a thrust nozzle extension having an inlet end connected to said nozzle section and widening outwardly from said nozzle section by a proportion greater than a ratio of expansion of an ambient pressure of the expanding gas;

said nozzle section and nozzle extension having a plurality of

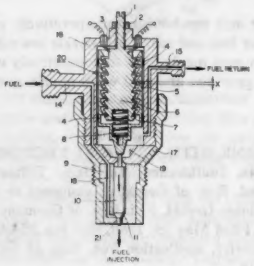
control fluid supply ports in the vicinity of said inlet end, disposed in at least one row extending in a longitudinal direction of said nozzle section and nozzle extension, for passing fluidic control pulses to said extension to cause a deflection of the expanding gases; and

control fluid supply means connected to said ports for supplying control fluid through said ports as a function of a peripheral inside pressure exerted by the expanding gases on an inside surface of said extension, so that a first supply port in said row at which the inside pressure falls below a predetermined limit value is opened for the supply of control fluid therethrough and any supply port upstream of said first supply port at which the inside pressure is above said predetermined limit value, is closed.

4,351,480
FUEL INJECTION VALVE FOR AN AUTOMOTIVE VEHICLE

Kenji Masaki, Yokohama, and Masaaki Saito, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 30, 1980, Ser. No. 202,354
Claims priority, application Japan, Nov. 7, 1979, 54-154507
Int. Cl.³ B05B *1/14*
U.S. Cl. 239—585 **4 Claims**



1. A fuel injection valve for an automotive vehicle, comprising:

(a) a housing having a nozzle at the one end portion thereof through which fuel is ejected, a valve seat portion proximate said nozzle, and a fuel passageway having an inlet portion formed in said housing near a middle portion thereof and an outlet portion formed in said housing near the nozzle;

(b) a valve element for opening and closing the nozzle, said valve element being disposed against the valve seat portion within said housing communicating with the fuel passageway, said valve element being urged in the direction of opening the nozzle when fuel pressure acts on the valve seat portion;

(c) a saw-toothed armature having radially extending flat surfaces and having said valve element at an end thereof, said armature being free to move in the axial direction within said housing;

(d) a saw-toothed core having radially extending flat surfaces and being provided with a coil wound around said saw-toothed core and energized by a unidirectional current, said core being fixed to said housing, the radially extending flat surfaces of said saw-toothed core forming a plurality of working surfaces in cooperation with the radially extending flat surfaces of said saw-toothed armature in order to actuate said armature in the axial direction, said saw-toothed core being operable to urge said armature in the direction of closing the nozzle when said coil is energized; and

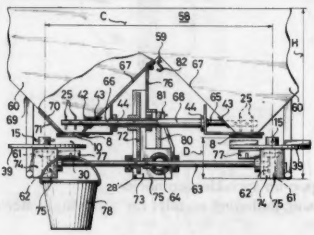
(e) a spring positioned between said armature and said core, said spring urging said armature in the direction to close the valve, the closing force of said spring being less than the opening force due to fuel pressure applied on said valve element,

whereby said armature and said core cooperate to operate said valve element with a fast response time to open said nozzle when said coil is deenergized.

4,351,481
CENTRIFUGAL SPREADER, ESPECIALLY FOR GRANULATED FERTILIZERS

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Aug. 8, 1979, Ser. No. 64,680
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835011
Int. Cl.³ A01C *17/00*
U.S. Cl. 239—670 **20 Claims**

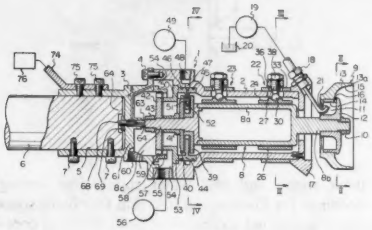


1. In a centrifugal spreader, suitable for spreading granulated fertilizers, comprising a funnel-shaped hopper equipped with a bottom plate, means defining a discharge outlet in the bottom plate, adjustor means for adjusting the size of and shutting off the outlet, a rotatable agitator disposed in the hopper, a rotatable spreading means disposed beneath the hopper for receiving fertilizer issuing from the outlet and spreading the fertilizer, the spreading means being mounted on a drive shaft which terminates outside of the hopper, means for rotating the spreading means, means for rotating the agitator at a substantially lower speed than the speed of the spreading means, the spreading means being releasably mounted on a drive shaft and being exchangeable for a different spreading means and fastening means for said releasable mounting, the improvement which comprises means for positioning the spreading means to dispose same in a position in which the distance (A) situated between the highest point of the spreading means and the part of the hopper situated above said highest point as seen longitudinally of the drive shaft, is greater than the distance (B) between the lower edge of the fastening means of the spreader means and the upper end of the drive shaft, whereby removal of the spreading means is convenient, and means for attaching a catching container underneath the discharge outlet and below the position of the spreader means, and wherein, after removal of the spreader means from its drive shaft, a free space is present beneath the discharge outlet of the hopper for the passage of the fertilizer flowing out of the discharge outlet into a catching container attached as aforesaid.

4,351,482
ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Matsuyoshi Sugiyama, Susono; Teru Morishita, Shizuoka, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 16, 1980, Ser. No. 197,635
Claims priority, application Japan, May 26, 1980, 55-69007
Int. Cl.³ B05B 5/04
U.S. Cl. 239—703 **19 Claims**



1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

feeding means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

non-contact type radial bearing means arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state;

non-contact type thrust bearing means arranged in said housing and cooperating with said rotary shaft for axially supporting said rotary shaft under a non-contacting state;

a generator generating a negative high voltage and having an output connected to said housing;

an axially extending electrode arranged in said housing and having an inner end and an outer end which is in contact with the rear end of said rotary shaft for electrically connecting said output to said spray head;

a cooling air source, and;

a cooling air passage having a cooling air inlet and an air passage portion which extends within said electrode and has a cooling air outlet formed on the outer end of said electrode, said cooling air inlet being connected to said cooling air source for feeding a cooling air from said cooling air source into said cooling air passage to discharge the cooling air from said cooling air outlet.

4,351,483
SEPARATION OF ARSENIC FROM FLUORITE ORE, BY MEANS OF MAGNETIC SEPARATION AND FLOTATION OF THE PYRITES TO WHICH IT IS ASSOCIATED

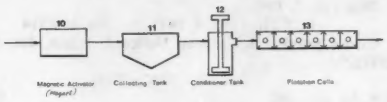
Ricardo Castillo-Gonzalez, San Luis Potosí, Mexico, assignor to Cia Minera Rio Colorado, S.A., San Luis Potosi, Mexico

Filed Jun. 4, 1980, Ser. No. 156,524
Int. Cl.³ B02C 23/18
U.S. Cl. 241—24 **9 Claims**

1. A process for separating arsenic in all its forms present in pyrites from fluorite ore, said pyrites including at least one of magnetic, non-magnetic and slightly magnetic pyrites, comprising the sequence of the following steps:

(A) wet milling the ore to obtain a pulp of fluorite ore of which at least 85 percent passes through a 200 mesh (Tyler);

(B) subjecting the pulp to the action of a magnet effective to magnetically activate most of the non-magnetic and the slightly magnetic pyrites;



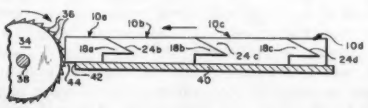
(C) recovering the magnetic pyrites in a collection tank by means of one or more electromagnetic bars positioned inside said tank; and

(D) finally recovering the remaining non-magnetic and slightly magnetic pyrites by conditioning these pyrites with flotation chemical agents followed by flotation in flotation cells.

4,351,484
METHOD OF GRINDING MAGNESIUM INGOTS AND SUCH INGOTS

Robert J. Hart, 190 Briar Wood Crossing, Lawrence, N.Y. 11559

Continuation-in-part of Ser. No. 840,811, Oct. 11, 1977, abandoned, which is a continuation of Ser. No. 717,540, Aug. 25, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 924,956
Int. Cl.³ B02C 19/12
U.S. Cl. 241—30 **8 Claims**



1. A method of grinding metallic ingots into finely divided form, comprising:

(a) providing a cutting element including a plurality of teeth;

(b) providing a plurality of ingots, each of said ingots comprising a main body having a lower surface, a front end and a rear end, said rear end having an outwardly extending projection and said front end having a corresponding recess at least partially defined by a lower surface, said lower defining surface of said recess defining a plane having an angle α associated therewith relative to a plane extending through the ingot perpendicular to the lower surface thereof, α being selected such that $0° < \alpha \leqq 90°$;

(c) arranging the ingots in end-to-end relation with the projection of each ingot in the corresponding recess of the next ingot; and

(d) disposing the lower surfaces of the ingots on a guideway and feeding the ingots, front ends first, along the guideway into the cutting element to sequentially grind each ingot, including the projection thereof, into finely divided form.

4,351,485
SHREDDING MACHINES

John P. Hardwick, Crewe; Michael J. Pezet, Quorn, both of England; Asadollah A. Sarvestany, Tehran, Iran, and Dayananda Satharasinghe, Singapore, Singapore

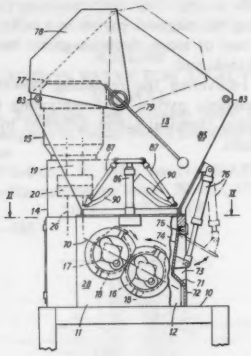
PCT No. PCT/GB79/00112, § 371 Date Mar. 5, 1980, § 102(e) Date Mar. 4, 1980, PCT Pub. No. WO80/00128, PCT Pub. Date Feb. 7, 1980

PCT Filed Jul. 4, 1979, Ser. No. 190,314

Claims priority, application United Kingdom, Jul. 5, 1978, 28952/78

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—36 9 Claims



1. A rotary shredding machine comprising means for forming a comminuting chamber, an upper cutter shaft and a lower cutter shaft arranged for simultaneous contrarotation, each cutter shaft carrying disc-like cutters, said cutter shafts extending through said chamber means with cutters of one shaft being interleaved with those of the other shaft in a cutting zone between the shafts, a feed hopper above the chamber means, the chamber means having side exit means for opening in response to the presence of an intractable object above the cutting zone whereby such object can be ejected through the side exit means, said cutter shafts being disposed with their axes in spaced generally parallel relationship in a common plane inclined to the horizontal, said side exit means comprising an aperture and an access door, said aperture being in a side of said chamber means adjacent the cutters of said lower cutter shaft, said aperture being directed outwardly from and with respect to said chamber means in a direction generally transverse to the axis of said lower cutter shaft, said access door being openable and closable for opening and closing said aperture, and said shredding machine including means responsive to the nonrotation of said cutter shafts under crash stop conditions for effecting the opening of said access door.

4,351,486
PROCESS AND A GRINDING STONE FOR PREPARING MECHANICAL WOOD PULP

Karl-Heinz Schmöller, Haar; Theodor Bähr, Heidenheim; Ernst Böttger, Herbrechtingen-Eselsburg; Hans-Otto Henrich, Heidenheim; Helmut Thumm, Heidenheim, and Heinz Beck, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim and Dyckerhoff & Widman AG, Munich, both of, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,285

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853716; Feb. 20, 1979, 2906449

Int. Cl.³ B02C *19/00*

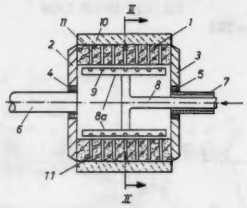
U.S. Cl. 241—67 25 Claims

1. A rotatable grinding stone for preparing wood pulp, said grinding stone comprising:

an annular rotatable core with an interior for defining a free inner space;

a grinding layer around said core for grinding wood into pulp, said core and said grinding layer being adapted to transmit water through themselves;

a water supply line in and extending axially along said free



inner space, and said water supply line having outlet openings for discharging into said free inner space;

pressure increasing means being defined at said core interior for locally increasing the water pressure at said core interior at said pressure increasing means, thereby to urge transmission of water out through said core and said grinding layer.

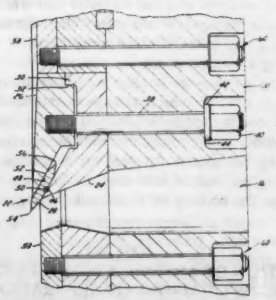
4,351,487
KNIFE ASSEMBLY FOR CHOPPING APPARATUS

Jack R. Haller, Wausau, and William M. Haselton, New Berlin, both of Wis., assignors to Murray Machinery, Inc., Wausau, Wis.

Filed Sep. 15, 1980, Ser. No. 187,164

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—92 3 Claims

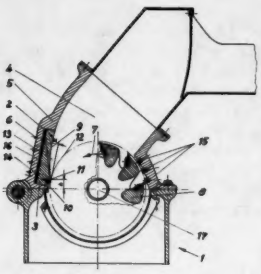


3. An elongated, reversible knife for attachment to a chopping disc, said knife having two opposite cutting edges each defined by two intersecting bevel surfaces, said knife having a pair of opposite flat surfaces extending completely between said bevel surfaces, and an arcuate recess formed in and along only one of said flat surfaces and being centered along the length of one of said flat surfaces for the reception of a complementary shaped rod of a knife holding means on said chopping disc.

4,351,488
FEED BARS FOR SHREDDING MILLS

Viktor Hess, Augsburg, Fed. Rep. of Germany, assignor to Alpine Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 696,279, Jun. 15, 1976, abandoned.
This application Jan. 18, 1978, Ser. No. 870,434
Int. Cl.³ B02C 18/22
U.S. Cl. 241—224 10 Claims



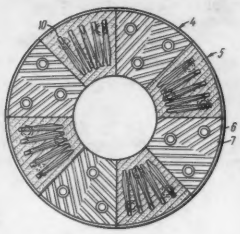
1. A shredding mill comprising a rotor, a plurality of knife edges carried by said rotor on the periphery thereof for rotation about the axis of the rotor, the path of the knife edges about said axis defining a cylindrical envelope, a housing in part defining an entrance chamber for feeding material to said rotor to be shredded, said entrance chamber including a generally wedge-shaped entrance throat, said throat being in part defined by said envelope, a feed bar removably mounted to said housing, said feed bar having two intersecting surfaces, one of said surfaces being anterior and the other posterior with respect to the direction of rotation of said rotor, said anterior surface in part defining said entrance throat, a stationary cutting edge positioned substantially at the intersection of said surfaces and parallel to the axis of said rotor, said cutting edge being closely adjacent to said enveloped for cooperating with the knife edges of said rotor, means other than a pivotable means for varying the shape and size of said entrance throat, and said means including means for changing the position of said cutting edge around the axis of said rotor whereby said mill may be made capable of accepting different materials having varying acceptance characteristics.

4,351,489
REFINER DISK

Lev N. Laptev, Institutsky prospekt. 9, kv. 30; Sergei S. Legotsky, Institutsky prospekt, 9, kv. 18, both of Leningrad; Viadimir A. Semenovsky, ulitsa Promyshlennaya, 1, kv. 3, Karelskaya ASSR, Kondopoga; Sergei S. Sambursky, ulitsa Kilbi, 8, kv. 24, Tallin; Abram B. Litvinov, ultisa Anokhina, 35, kv. 18, and Alexei I. Kondrashov, ulitsa Meretskova, 9, kv. 50, both of Petrozavodsk, all of U.S.S.R.

Continuation of Ser. No. 917,677, Jun. 21, 1978, abandoned.
This application Dec. 31, 1979, Ser. No. 108,527
Int. Cl.³ B02C 7/12
U.S. Cl. 241—261.3 4 Claims

1. In a paper pulp refiner wherein a pair of planar refining disks are juxtaposed, at least one of said disks rotating relative to the other, said one disk being a refiner rotor disk comprising a base supporting a combined metal-ceramic refining plate secured thereto, said metal-ceramic refining disk place having a plurality of metallic sectors and a plurality of alternately disposed abrasive sectors, said sectors being each bounded by radii converging toward the center of said plate, said metallic sectors and ceramic sectors having operating surfaces, the operating surfaces of said metallic sectors being level with the operating surface of the ceramic sectors and having rectangular channels depressed below said operating surface of said metallic sectors, said operating surface of said metallic sectors and channels defining a series of refining bars, said abrasive ceramic sectors having channels below the operating surface

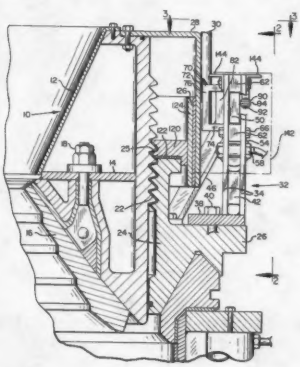


of said sectors; said metallic and ceramic sectors being disposed parallel to the disk plate, all of said metallic and ceramic sectors being fastened to said plate.

4,351,490
POWER DRIVE STRUCTURE FOR ROTATING THREADEDLY SUPPORTED ROCK CRUSHER BOWLS

Louis W. Johnson, 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Apr. 16, 1980, Ser. No. 140,728
Int. Cl.³ B02C 2/04
U.S. Cl. 241—286 9 Claims



1. A power driven bowl rotating mechanism for use with rock crushers of the type having a base member and a bowl threadedly supported on the base member whereby upon rotation thereof the bowl is arranged to be raised or lowered, the bowl being of the type which has a plurality of projections secured in spaced relation around the periphery thereof, said power driven bowl rotating mechanism comprising

(a) an upright frame arranged to be secured to the base member of a crusher,

(b) a slide bar supported on said upright frame for horizontal slidable movement,

(c) first double acting means connected between said upright frame and said slide bar and arranged to drive said slide bar longitudinally in reciprocating movement,

(d) driver means pivotally mounted on said slide bar arranged for movement inwardly and outwardly relative to the bowl,

(e) socket means in said driver means arranged to engage the projections on the bowl in an inward position of said driver means whereby the bowl is rotated by operation of said slide bar in one direction of its reciprocating movement and upon outward movement of said driver means out of engagement of said socket means with the projec-

tions, said driver means is movable with said bar in the other direction of reciprocating movement into a position for engagement of said socket means with a succeeding projection for further rotation of said bowl upon operation of said double acting means,

(f) and second double acting means connected between said slide bar and said driver means for pivoting the latter between its inner and outer positions,

(g) said socket means having a driving edge on each defining side thereof for driving the bowl in either direction of rotation as well as for holding the bowl from overrunning after each rotative function.

4,351,491

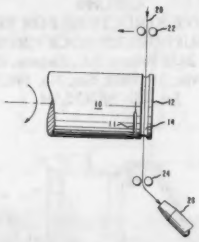
YARN PACKAGE SUPPORT TUBE

Broadus E. Hill, Jr., Wilmington, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1981, Ser. No. 253,824

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—18 PW **2 Claims**



1. A yarn support tube having a surface stringup groove extending partially around its circumference and located adjacent one of its ends for initiation of a helical transfer tail, said tube being also provided with a smooth-surfaced circumferential groove located between said one end and said stringup groove.

4,351,492

METHOD FOR THREADING A YARN DELIVERED FROM A GODET ROLLER ON A BOBBIN AND AN APPARATUS FOR EFFECTING THE SAME

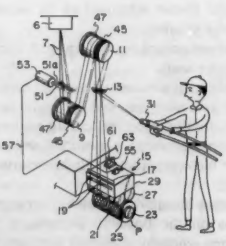
Hideki Aoyama, and Takashi Kishida, both of Matsuyama, Japan, assignors to Teijin Limited, Ehime, Japan

Filed Nov. 2, 1979, Ser. No. 90,593

Claims priority, application Japan, Nov. 7, 1978, 53/152314[U]

Int. Cl.³ B65H *54/02*

U.S. Cl. 242—18 R **13 Claims**



1. In a process wherein a bobbin rotatably supported on and rotated by a winding apparatus may receive a yarn delivered to the bobbin via a godet roller, a method for threading the yarn on the bobbin, comprising the steps of:

providing a godet roller having a circumferential yarn delivery zone and an adjacent circumferential yarn threading zone axially spaced from said yarn delivery zone, disposed so that said yarn may be delivered to and taken up by said bobbin via said yarn delivery zone of said godet roller, said yarn delivery zone having a surface for substantially preventing circumferential and axial slippage of said yarn thereon;

thereafter providing relative axial movement between said yarn and said godet roller, so that said yarn engages only the yarn threading zone of the godet roller, said yarn threading zone presenting (i) a relatively low friction surface to permit slippage of said yarn in the circumferential direction of the godet roller when the yarn tension exceeds a given value, and (ii) a relatively high friction surface to resist slippage of said yarn in the axial direction of the godet roller;

engaging the free end of the yarn traversing the yarn threading zone of the godet roller with said bobbin, so that said free end is caught thereby; and

subsequently providing relative axial movement between said yarn and said godet roller, so that said yarn again engages only the yarn delivery zone of the roller, whereby any change in tension in said yarn while said yarn is threaded on said bobbin can be distributed in yarn located upstream and downstream of said godet roller and entanglement of said yarn around said godet roller is prevented.

4,351,493

TAPE TENSION CONTROL FOR A TAPE RECORDER

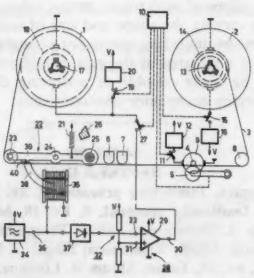
Martin Sonnek, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,501

Claims priority, application Austria, Sep. 20, 1979, 6203/79

Int. Cl.³ B65H *59/38*; G05B *5/00*; G03B *1/04*

U.S. Cl. 242—190 **13 Claims**



7. A recording and/or reproducing apparatus for a record carrier in the form of a tape, comprising:

a source of biasing force,

a tape-tension sensor having a tape guide moveable against said biasing force along which the record carrier tape is passed, the sensor further comprising at least one coil and a metal part which cooperates with said coil,

an oscillator for energizing said at least one coil so as to produce a signal voltage, the amplitude of the signal voltage being a measure of the tape tension, and

a tape-tension control including a control circuit, for influencing the tape tension, said signal voltage being applied to said control circuit,

characterized in that said sensor comprises a single coil only, and that the metal part comprises a damping element for the coil which varies the quality factor of the coil by

movement of the metal part responsive to movement of the tape guide.

4,351,494

BOBBIN TRANSPORT APPARATUS AND METHOD

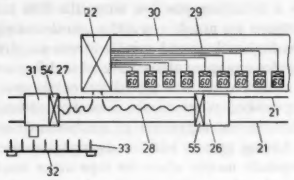
Heinz Schippers; Gerd Münnekehoff, both of Remscheid, and Udo Teich, Sprockhövel, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik, Remscheid, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,349

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939675; Nov. 14, 1979, 2945861

Int. Cl.³ B65H *54/26*

U.S. Cl. 242—35.5 A **17 Claims**



1. A bobbin transport apparatus adapted for use with a textile yarn processing machine having a plurality of yarn winding stations aligned along at least one side thereof and with the winding stations each having a bobbin mounting means, said apparatus comprising

a carriage adapted for movement along the side of the textile yarn processing machine,

means mounted on said carriage for receiving and supporting a full bobbin from a bobbin mounting means of the textile yarn processing machine or the like, and

measuring means mounted on said carriage for determining the weight of each bobbin while it is supported on said carriage.

4,351,495

THREAD-STORAGE AND DELIVERY DEVICE FOR TEXTILE MACHINES

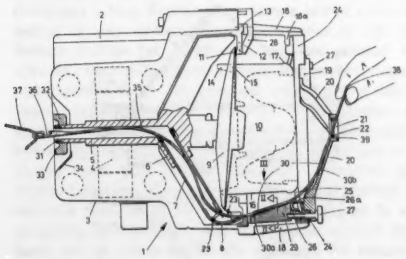
Fred B. Lindström, Jönköping, and Alf R. A. Bengtsson, Fritsla, both of Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 12, 1980, Ser. No. 177,164

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932782

Int. Cl.³ B65H *51/20*

U.S. Cl. 242—47.01 **14 Claims**



1. In a thread-storage and delivery device for textile machines, including a stationary base member, a hollow shaft rotatably mounted relative to the base member for driving a thread-feeding structure which includes a feed member for tangentially winding the arriving thread on the surface of a stationary storage drum, from which storage drum said thread is unwound over a drum edge at one end of the drum through a braking ring which surrounds the drum edge and through a center removing guide which is disposed adjacent said one drum end and is supported on a structural part fastened on the base member, which structural part at least partially surrounds but is spaced from the storage drum, the improvement comprising axial guideway means defining a guideway for guiding therethrough a threading needle, said guideway extending from a location adjacent to the free end of the feed member to a location adjacent said removing guide, said threading needle in an inserted condition extending through the hollow shaft, the feed member, the braking ring and the removing guide, said guideway means being disposed in a limited peripheral sector of said structural part, and a turning handle connected to the hollow shaft for aligning the end of the feed member with the guideway.

4,351,496

SAFETY BELT ROLL-UP DEVICE

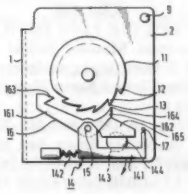
Artur Föhl, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,631

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2931075

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. Safety belt roll-up device with a locking pawl mechanism for a vehicle comprising a frame, a rotatable belt shaft on which a belt is wound mounted in the frame, a locking wheel with locking teeth of a defined pitch in fixed connection with said belt shaft, a double locking pawl having two lever arms with each lever arm having a pawl tooth for engagement with the locking teeth of said locking wheel, a common pivot axis mounted in the frame, said two lever arms rotatably mounted on said common pivot axis with one lever arm extending on one side and the other lever arm on the other side of the pivot axis along the circumference of the locking wheel, and with pawl teeth of said two lever arms adjacent to but out of engagement with said locking teeth of said locking wheel, said pawl teeth of the two lever arms spaced a distance which is different than the pitch of the locking teeth of the locking wheel or a multiple thereof, a release mechanism responsive to acceleration or deceleration of the vehicle which exceeds a permissible limit mounted on the frame, engaging means activated by said release mechanism when said permissible limit is exceeded to move said double locking pawl and cause engagement of the locking pawl with the locking teeth of the locking wheel.

4,351,497
CASSETTE FOR BAND MATERIAL

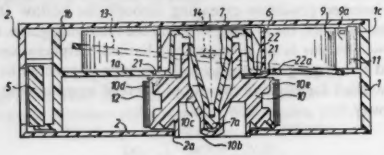
Werner Kiessling, Unterhaching; Otto Wiedemann, Starnberg; Peter Lau, and Gabriel Vondrovsky, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,102

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005630

Int. Cl.³ G03B *1/04*

U.S. Cl. 242—194 **9 Claims**



1. A cassette for band material, particularly for photographic film, comprising a housing having a divider wall; a band supply spool at one side of said wall and, coaxial thereto and at the other side of said wall, a band take-up spool in said housing; rotating means for rotating said take-up spool in one direction to withdraw band material from said supply spool and take it up on said take-up spool; and anti-reversing means for preventing rotation of said take-up spool in an opposite direction counter to said one direction, said anti-reversing means comprising a plurality of holes in said divider wall located coaxial to said take-up spool, and a springy finger projecting from a surface of said take-up spool which is juxtaposed with said divider wall, said springy finger being directed in said opposite direction and projecting towards said divider wall.

4,351,498
CASSETTE TAPE DEVICE

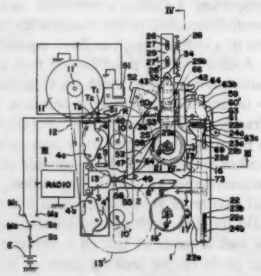
Mitsuo Iwata; Naomasa Masuda; Hideki Uraki, and Kunio Tsuchino, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Sep. 19, 1980, Ser. No. 188,979

Claims priority, application Japan, Sep. 19, 1979, 54-120987; Jan. 31, 1980, 55-11077; Jun. 5, 1980, 55-76281

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—204 **9 Claims**



2. A cassette tape device having first and second driving means for driving first and second reels of the cassette, a tape drive mechanism having a play position in which the tape drive mechanism is positioned to advance and play a tape, and a release position in which the tape drive mechanism is positioned as to cease advancing the tape, and a control means for controlling the movement of the tape drive mechanism, wherein said control means comprises:

an electric motor operatively coupled to said first and second driving means for driving at least one of the first and second driving means;

switch means coupled to said motor for turning said motor means on and off;

first and second spindle means for receiving said first and second reels, said first and second spindle means being rotated by the rotation of the first and second driving means, each spindle means being stopped from rotation when a predetermined external load is applied thereto;

detecting means operatively coupled to said first driving means for detecting whether the first and second spindle means are driven, said detecting means being movable between a detecting position when the first and second spindle means are not driven and a non-detecting position when the first and second spindle means are driven;

latch means for engaging at least one of said first and second spindle means, when the tape drive mechanism is in the release position, wherein the first and second spindle means are latched regardless of rotation of the first and second driving means, and for disengaging the first and second spindle means when the tape drive mechanism is moved to the play position to thereby allow the first and second spindle means to rotate;

shifting means operatively coupled to said motor for shifting the tape drive mechanism from the release position towards the play position when said detecting means is moved to the detecting position; and

retaining means for retaining the tape drive mechanism in the play position, said retaining means being energized by the operation of said switch means, wherein when said switch means is off and the tape drive mechanism is in the play position, the retaining means is de-energized, the tape drive mechanism returns towards the release position and the latch means engages at least one of the first and second spindle means and wherein the switch means is on, the detecting means is moved to the detecting position to thereby shift the tape drive mechanism towards the play position, and the retaining means is actuated to maintain the tape drive mechanism in the play position.

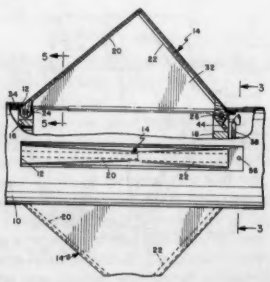
4,351,499
DOUBLE FABRIC, RETRACTABLE, SELF-ERECTING WING FOR MISSLE

Inge Maudal, Claremont; Larry D. Wedertz, Mira Loma, and Kenneth M. Yost, Glendora, all of Calif., assignors to General Dynamics, Pomona, Calif.

Filed Sep. 24, 1979, Ser. No. 77,966

Int. Cl.³ F42B *13/32*

U.S. Cl. 244—3.27 **14 Claims**



1. In a missile having an elongated body, the body having an outer wall with a plurality of circumferentially spaced, longitu-

dinally extending slots therein, a retractable, self-erecting wing mounted in each slot, each wing comprising:

a wing supporting strut assembly comprised of at least one elongated strut element operably mounted in the slot, said strut assembly being adapted to move from a retracted position completely within said outer wall of said body to an extended position projecting from the body;

biasing means urging said strut assembly toward the extended position;

a wing member of flexible fabric material in the form of a double walled pocket conforming substantially to the extended configuration of the strut assembly and movable therewith, said wing member being secured to said outer wall around the periphery of the slot and enclosing said strut assembly between the fabric walls and within the pocket of said double walled pocket;

retaining means operably mounted in the body for releasably holding, against the force of said biasing means, the wing in a retracted position with the strut assembly and wing member folded within the slot;

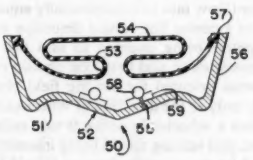
and extension means operably mounted on the body for releasing said retaining means thereby extending the wing pursuant to the force of said biasing means.

4,351,500

SKI/FLOAT LANDING GEAR APPARATUS FOR AIRCRAFT

Richard R. Golze, 637 Kingsley Trail, Bloomfield Hills, Mich. 48013

Filed Jul. 17, 1980, Ser. No. 169,614
Int. Cl.³ B64B *25/56*
U.S. Cl. 244—105 **3 Claims**



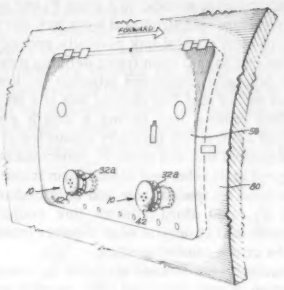
1. An aircraft ski float having a high aspect ratio, and having a long flexible resilient base made of polymeric material and having a long, thin floatation bag joined to lateral extremities of the base and extending longitudinally on the base, and means to selectively inflate and deflate the bag, said base comprises a thin shell having a bottom portion and upward extending sides terminated in upward lateral extremities and wherein the bag comprises a long flexible sheet having lateral extremitie connected to said upward lateral extremities of the base, said bottom portion has a central downward pointed V-shaped apex and wherein portions of the bottom portion slope upward and outward from the apex and wherein said sides extend upward from outward extremities of the base portion and slope upward at greater angles than the base portion, said bottom having flat central portions joining on either side of said V-shaped apex and further including downward extending rounded portions joining the said flat central portions and said sidewall portions of the base, plural openings in said base extending therethrough, and wherein an aircraft engine exhaust line is connected to the openings for exhausting gas downward through the openings to create a boundary layer effect, said engine exhaust inflates the bag and the base and then escapes through the openings via check valves which prevent reverse flow of fluid through the openings when the bag is deflated via said deflative means.

4,351,501

RAM AIR ENHANCED RELIEF VALVE

Douglas E. Peash, Enumclaw, and Arthur S. Yorozu, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 19, 1979, Ser. No. 95,759
Int. Cl.³ B64D *13/04*
U.S. Cl. 244—129.1 **12 Claims**



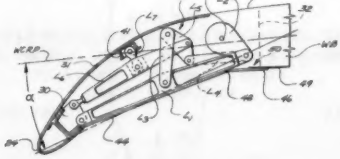
3. A negative pressure relief valve for an aircraft mounted to be resiliently closed by an aircraft door latching mechanism, wherein the valve comprises: an inner poppet valve having a semi-circular tubular member joined at an inboard end to a concentric disk having a larger diameter, an outer poppet valve having a facing semi-circular tubular member joined at an outboard end to a vented concentric disk having a larger diameter, means for sealing between the two valves, a valve housing mounted to an outer wall of an aircraft, means for supporting and for sealing the valves to the housing along each lengthwise edge, and means for holding the two valves in a contacting closed engagement and for simultaneously moving the valves apart in response to negative air pressure across the inner valve to permit airflow through the valves.

4,351,502

CONTINUOUS SKIN, VARIABLE CAMBER AIRFOIL EDGE ACTUATING MECHANISM

Frank D. Statkus, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 21, 1980, Ser. No. 142,121
Int. Cl.³ B64C *3/48*
U.S. Cl. 244—219 **24 Claims**



1. In a continuous skin variable camber airfoil of the type having (i) a rigid, centrally located, span-wise structural wing box including means defining both leading and trailing structural main frames, (ii) a leading structural edge member spaced forwardly from said wing box, (iii) a trailing structural edge member spaced rearwardly from said wing box, and (iv) a wing chord reference plane extending through the leading and trailing edges of said airfoil, an improved actuating mechanism for interconnecting at least one of said leading and trailing structural edge members to said main frame defining means so as to permit controlled deflection of said at least one structural

edge member relative to said wing chord reference plane while providing structural load bearing support for said at least one structural edge member in all operating positions thereof, said actuating mechanism comprising, in combination:

(a) a first 4-bar linkage assembly for controlling horizontal and vertical displacement of said structural edge member and including (i) said main frame defining means, (ii) a first generally horizontal control link pivotally connected adjacent one end thereof to the lower inboard edge of said structural edge member at a point P_1 and projecting therefrom toward said structural wing box, (iii) a second generally upright control link pivotally connected adjacent its upper end to said main frame defining means at a point P_2 and pivotally connected adjacent its lower end to the other end of said first control link at a point $P_{1,2}$, and (iv) a third control link having a length greater than said second control link pivotally connected at one end to said first control link at a point $P_{1,3}$ intermediate points P_1 and $P_{1,2}$ and at its other end to said main frame defining means at a point P_3 spaced from and intermediate the points P_1 and P_2, said third control link projecting generally towards said structural edge member from point P_3 when in the cruise camber position;

(b) a second 4-bar linkage assembly for controlling angular rotation of said structural edge member and including (i) said first control link, (ii) a fourth generally horizontal control link pivotally connected at one end to said first control link at point $P_{1,2}$ and extending towards and terminating short of point $P_{1,3}$, (iii) a fifth generally upright control link pivotally connected at its lower end to the free end of said fourth link at a point $P_{4,5}$ and pivotally connected at its upper end to said main frame defining means at point P_3, and (iv) a sixth generally horizontal control link pivotally connected at one end to the upper inboard edge of said structural edge member at a point P_6 and pivotally connected at its opposite end to said fifth control link at a point $P_{5,6}$ intermediate points P_3 and $P_{4,5}$; and,

(c) actuating means for causing the pivotal connection at point $P_{1,2}$ between said first, second and fourth control links to pivot about point P_2.

4,351,503

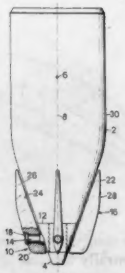
STABILIZED PROJECTILES

Mordeki Drori, 89 Zahal St., Kiron, Israel

Continuation of Ser. No. 650,045, Jan. 19, 1976, abandoned. This application Feb. 25, 1980, Ser. No. 124,219

Int. Cl.³ F42B *15/16*

U.S. Cl. 244—3.24 **8 Claims**



1. A ballistic projectile characterized in that it includes at least three stabilizing fins symmetrically arranged around the nose of the projectile well forward of its center of mass, each of said fins being independently pivotable on an axis extending radially of the projectile and intersecting the projectile axis at a right angle thereto so as to be pivotable to one side or the other side of the projectile axis for stabilizing the projectile, the leading edge of each fin, and the pivot axis of each fin, being located with respect to the foremost point of the projectile, inclusive of its said fins, a distance which is substantially less than the length of the fin.

4,351,504

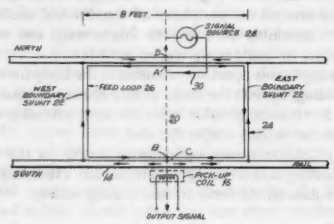
TRACK CIRCUIT PRINCIPLE WHEEL DETECTOR

Klaus H. Frielinghaus, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 5, 1980, Ser. No. 127,281

Int. Cl.³ B61L *13/04*

U.S. Cl. 246—249 **7 Claims**



1. A system for detecting the presence and position of wheel-axles on railroad cars comprising:

a pair of rails;

a transmitter or signal source having a high frequency output;

a pair of current carrying loops, the first loop including said pair of rails and a pair of boundary shunts connecting said rails so as to define a detection zone;

the second loop extending in close proximity to and inside said first loop, said first and second loops being subdivided for current flow into two substantially equal portions with respect to a center line of said detection zone;

said transmitter being coupled to said pair of loops, and being connected to said first loop on said center line; and,

sensing means oriented for sensing field changes due substantially only to the direction of wheel-axle shunt current flow when a wheel-axle contacts said rails in said detection zone, said sensing means being insensitive to the fields produced by the currents flowing in said loops.

4,351,505

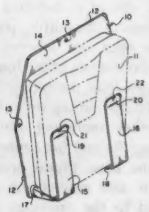
BATHROOM SCALE HOLDER

Edward Wickersham, 190 Nicholson Rd., West Collingswood Heights, N.J. 08059

Filed Apr. 11, 1980, Ser. No. 139,280

Int. Cl.³ A47F *5/00*; A47H *1/10*

U.S. Cl. 248—316 D **8 Claims**



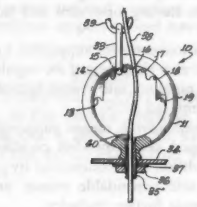
1. A bathroom scale holder comprising

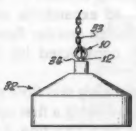
(a) a panel member comprising a rigid sheet of a size approximately that of the typical bathroom scale,

(b) attachment means to hold the panel firmly against a wall,

(c) two horizontal cantilever members extending from and structurally attached to a lower portion of the panel,
(d) two spring members,
(e) adjustable attachment means connecting one of the spring members to one of the horizontal cantilever members allowing the spring members to be adjusted as to its horizontal position for the panel and causing the connection to be firmly held in a chosen position,
wherein the spring members extend in a generally vertical direction and toward the front surface of the panel to hold a scale placed on the horizontal cantilever members against the panel surface, and
wherein at least one of the two pairs of cantilever-spring members through adjustable fastening means, adjusts the angle of the spring members from a generally vertical alignment to an alignment wherein the spring members are angled toward each other along a plane generally parallel with the panel member.

4,351,506
LOOP FOR LEVELING A HANGING LAMP
Reynolds K. Ohai, 8135 Pinositas Rd., Whittier, Calif. 90605
Filed Mar. 2, 1981, Ser. No. 239,354
Int. Cl.³ F21V *21/00*
U.S. Cl. 248—344 **7 Claims**

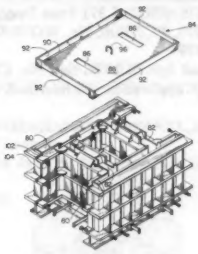




1. A loop for leveling a hanging lamp, said loop comprising:
a closed loop having integral thereto a plurality of link receiving notches flanged along the inner and upper surface thereof; and
means integral to the lower surface of the loop for affixing said loop to a hanging lamp, said means allowing the rotating of said loop with respect to said lamp, whereby the hanging point of the lamp may be changed to overcome an imbalance of the lamp.

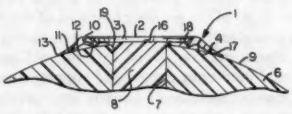
4,351,507
MULTI-PART FORM WITH IMPROVED TIE AND STRIPPING MEANS
Roger L. Toffolon, Hartford, and Warren E. Kart, Bristol, both of Conn., assignors to Doublewal Corporation, Plainville, Conn.
Filed Jan. 16, 1981, Ser. No. 225,692
Int. Cl.³ B28B *1/08, 7/10, 7/04*
U.S. Cl. 249—63 **11 Claims**

1. A multi-part form for casting concrete structural units for retaining walls and the like, the structural units having generally rectangular horizontally spaced parallel and vertical sidewalls which extend longitudinally and which have horizontally spaced parallel and laterally extending substantially vertical connecting arms integrally formed therebetween, the connecting arms each having a downwardly open mortise at the bottom and an upwardly projecting tendon at the top; and the form comprising stationary base and support means including horizontally upwardly exposed surfaces for forming the bottom surface of each sidewall and arm of a structural unit as described, a stationary core means generally rectangular in configuration viewed from above and having substantially vertical outwardly exposed surfaces for forming the inner surfaces of the arms of a structural unit and the inner surface of sidewalls of the unit between the arms, a pair of movable similar but opposite sidewall form members having substantially vertical surfaces for forming the substantially vertical outer surfaces respectively of the opposite sidewalls of a structural unit, a pair of movable similar but opposite arm and sidewall form members having substantially vertical surfaces for forming the substantially vertical outer surfaces of the arms



and inner surfaces of the sidewalls outwardly at the arms respectively at opposite ends of the structural unit, sidewall end surface form members having substantially vertical surfaces for forming the substantially vertical surfaces at the ends of the sidewalls of a structural unit, each of said latter form members being attached to and movable with one of said aforesaid movable members, tie means operatively associated respectively with each of said movable members and said stationary base and support means and serving to tie said movable members to said base and support means in inner and assembled positions of said movable members to provide a multi-part form for casting, and strip means operatively associated with each of said movable members and said stationary base and support means and serving to urge said movable members to outer and disassembled positions relative to said stationary base and support means in a form stripping operation.

4,351,508
REUSABLE PLUGGING DAM FOR BOWLING BALLS
Charles A. Hardman, 3326 W. 8th, Lawrence, Kans. 66044
Filed Oct. 9, 1979, Ser. No. 83,214
Int. Cl.³ B22D *19/04*
U.S. Cl. 249—90 **9 Claims**



1. A dam structure for detachably mounting upon a bowling ball comprising:
(a) a dam body forming an enclosure for extending substantially about a finger hole in a bowling ball for plugging same, said dam body being of resilient material and having inner and outer skirts defining a concave surface;

(b) said inner skirt forming a wall defining a filling port through said dam body;

(c) said inner and outer skirts diverge in sloping relationship and having diverging lower surfaces for sealing engagement with a bowling ball outer surface, said skirts defining a cavity therebetween for providing a partial vacuum chamber with an outer surface of a bowling ball; and

(d) said skirts being resiliently deformable downwardly upon manual pressure on said dam body toward said bowling ball to spread said skirts outwardly and at least partially exhaust air in said cavity to engage said dam body upon said bowling ball in self-sealing relationship.

4,351,509

VALVE WITH SERVO-COMMAND

Harald Stampfli, 51, chemin des Coudriers, CH-1209 Petit-Saconnex Geneva, Switzerland

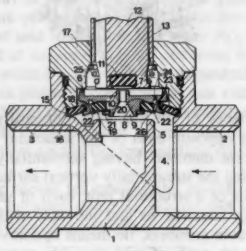
PCT No. PCT/CH79/00052, § 371 Date Dec. 6, 1979, § 102(e) Date Nov. 15, 1979, PCT Pub. No. WO79/00896, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 5, 1979, Ser. No. 179,289

Claims priority, application Switzerland, Apr. 6, 1978, 3693/78

Int. Cl.³ F16K *31/40, 31/385*

U.S. Cl. 251—38 **3 Claims**



1. A valve with servo-control means comprising a valve body, including an intake duct and an exhaust duct for fluid under pressure, a seat and main poppet valve mounted in said body, a control chamber in said body, a movable member controlling the movements of the poppet valve which causes the pressure prevailing in said control chamber to change, said control chamber being supplied with fluid under pressure through a calibrated intake channel connecting it with said pressurized fluid intake duct, said poppet valve having a centrally located passage for escape of the fluid from the control chamber to said exhaust duct characterized by the fact that the intake channel of the fluid under pressure in the control chamber communicates with an intake conduit which is open across from the edge of the seat which is upstream in relation to the flow of the fluid passing through the valve, said intake conduit being disposed in said poppet valve, said intake conduit opening being at the smallest cross section area of passage of fluid in the valve in all of the possible positions of the poppet valve in relation to said seat, said poppet valve including a fluid-tight gasket of elastic material fitted therein, said intake conduit located in said fluid-tight gasket, said poppet valve comprising a circular member including a housing for receiving said fluid-tight gasket, said gasket being ring shaped, the bottom surface of said housing having a ring-shaped slot therein, the diameter of said slot corresponding substantially to the outside diameter of the fluid-tight gasket, the intake conduit in said gasket comprising a plurality of notches on the periphery of said fluid-tight gasket, said notches opening into said ring-shaped slot, which in turn is connected with the upper surface of the circular member through said intake channel.

4,351,510

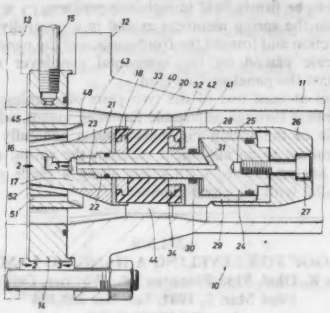
FLOW REGULATOR ASSEMBLY

Robert H. Welker, P.O. Box 138, Sugar Land, Tex. 77478

Filed Nov. 10, 1980, Ser. No. 205,286

Int. Cl.³ F16K *13/00*

U.S. Cl. 251—118 **4 Claims**



1. A gas line flow regulator which comprises:

(a) a flange held radially extending transverse plate supported within a pipeline having upstream and downstream faces thereon;

(b) a centrally positioned means supported by said transverse plate on the upstream side thereof for regulating the flow of gas through the pipeline, said means including:

1. an elongate centered body;

2. a resiliently expandable means supported by said body having a relaxed and expanded condition wherein the expanded condition is accompanied by a radial outward expansion of said expandable means, and wherein said expandable means further includes;

3. an exposed outer sealing surface thereon;

(c) spaced sealing surface means defined by the inner wall of the pipeline adjacent to said expandable means positioned within the pipeline to define an annular flow space therebetween which is variably constricted by said expandable means on expanding;

(d) said transverse plate terminating said flow space and having openings therethrough, there being a first opening means for directing flowing gas in a first direction downstream from said transverse plate and a second opening means therethrough for directing flowing gas in a second direction downstream from said transverse plate; and

(e) wherein said first opening means comprise a plurality of holes drilled through said transverse plate, said holes having inlet openings arranged on a circle, and wherein said second opening means comprise a plurality of holes drilled through said transverse plate arranged on a second circle which is larger than the first circle, and said first opening means are directed toward a point of intersection which, if extended downstream of said transverse plate, would intersect within the second circle.

4,351,511

SEALING GASKET FOR AN OBTURATOR SUCH AS A VENTILATION REGULATOR

Jean-Claude Garrigues, Ogeu-les-Bains, France, assignor to Applications Mecanique et Robinetterie Industrielle, A.M.-R.I., Paris, France

Filed Oct. 14, 1980, Ser. No. 196,575

Claims priority, application France, Oct. 11, 1979, 79 25365

Int. Cl.³ F16K *1/226*

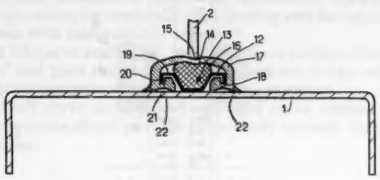
U.S. Cl. 251—174 **10 Claims**

1. A sealing gasket especially for an obturator utilized in a fluid-tight regulator valve, comprising:

a. a frame structure having a central core, with a central

concavity therein, said core being mountable to the frame of an obturator;

b. said frame structure having lateral wings which have an upwardly extending portion, said wings further having a portion thereof extending in a direction outwardly from said core and substantially transverse to said upwardly extending portions, said transverse portion further having end portions which downwardly extend therefrom;



c. a covering placed over the core and on said lateral wings, said covering having lateral edges which circumscribe and thereby grip the downwardly extending portions of said lateral wings so as to provide an effective seal between said covering and said lateral wings;

d. an elastic support placed in said central core between said core, lateral wings and said covering, said elastic support providing resilient support to said covering.

4,351,512

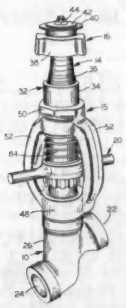
VALVE WITH YOKE AND CAPTIVE GLAND WRENCH

Chester A. Siver, 10 Fair Hill La., Suffield, Conn. 06078

Filed Oct. 9, 1981, Ser. No. 310,146

Int. Cl.³ F16K *41/02*; F16J *15/06*; F16L *21/04*

U.S. Cl. 251—214 **10 Claims**



1. In a valve assembly, the combination comprising:

A. a valve body having a bonnet opening therein and a flow passage therethrough;

B. a bonnet in said bonnet opening and having an outwardly facing axially extending recess therein;

C. a yoke member engaged with said valve body and extending outwardly therefrom, said yoke member having spaced inner and outer ring portions and a pair of yoke arms extending therebetween, said yoke inner ring portion being engaged with said valve body about said bonnet opening;

D. a valve stem extending through said yoke member and bonnet and into said valve body, said valve stem being movable axially relative thereto to open and close said flow passage through said valve body;

E. a packing gland having an axial passage through which said valve stem extends and a packing portion extending into said recess in said bonnet, said packing gland being rotatable and slidable axially along said valve stem and having a multiplicity of axially extending teeth about the circumference thereof along a portion thereof disposed outwardly of said bonnet; and

F. a gland wrench including a hub portion with an axially extending bore therethrough and a pair of arms projecting outwardly therefrom, the wall defining said bore including a portion with axially extending teeth thereon engageable with the teeth of said packing gland to effect rotation thereof about said valve stem, the arms of said gland wrench abutting said yoke arms upon rotation through a limited arc in a first direction, said gland wrench being movable axially relative to said packing gland to disengage the teeth thereof and thereby permit rotation of said gland wrench in the opposite direction and then reengagement of the teeth thereof to effect limited rotation of the packing gland in the first direction through a limited arc, whereby the packing gland may be moved inwardly against packing material disposed within said recess of said bonnet to seal any space about said valve stem passing therethrough.

4,351,513

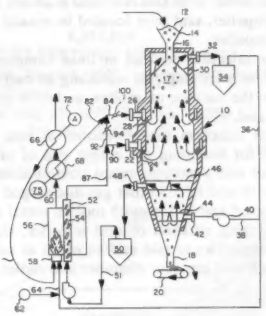
DIRECT REDUCTION OF IRON USING COKE OVEN GAS

Charles W. Sanzenbacher, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed Jan. 29, 1981, Ser. No. 229,687

Int. Cl.³ F27B *9/12*

U.S. Cl. 266—156 **6 Claims**



1. In apparatus for direct reduction of iron oxides to a metallized iron product, including:

(a) a generally vertical shaft furnace;

(b) means for charging particulate iron oxide material to the upper portion of said furnace to form a burden therein, and means for removing metallized iron product from the bottom of said furnace, whereby a continuous gravitational flow of said burden can be established through the furnace;

(c) a first reducing gas inlet intermediate the ends of the furnace;

(d) a second reducing gas inlet intermediate said first reducing gas inlet and the upper end of the furnace;

(e) a reacted gas outlet at the upper end of said furnace;

(f) means communicating with said reacted gas outlet for cooling and scrubbing reacted gas;

(g) a reformer furnace with catalyst containing tubes therein for the formation of gaseous reductants, said reformer furnace having an outlet communicating with said first and second reducing gas inlet;

(h) a source of process fuel gas; and

(i) a process fuel gas pipe communicating with said second reducing gas inlet and said source of process fuel gas;

the improvement comprising:

(a) said reformer furnace having at least one burner therein

for heating said catalyst-containing tubes and a spent combustion gas pipe for removing spent combustion gases from said reformer furnace; and

(b) said spent combustion gas pipe communicating with a heat exchanger, said heat exchanger also communicating with said process fuel gas pipe whereby process fuel gas passes through and is preheated in said heat exchanger.

4,351,514

APPARATUS FOR PURIFYING MOLTEN METAL

Fenton C. Koch, 12706 Rockhaven Rd., Chesterland, Ohio 44026

Filed Jul. 18, 1980, Ser. No. 169,998

Int. Cl.³ C21C *7/072*

U.S. Cl. 266—217 **5 Claims**

1. Apparatus for purifying molten metal such as aluminum or the like, comprising:

(a) structure defining a reservoir containing molten metal to be treated;

(b) an impeller housing submerged below the surface of molten metal in said reservoir;

(c) a rotatable pump impeller and a cooperating volute mounted within said housing, together defining an impeller chamber that extends into fluid communication with structure defining an outlet passage for said chamber, said passage disposed below the surface of molten metal;

(d) an impeller drive supported on a platform located above the surface of molten metal and operatively connected to the impeller by a drive shaft, said drive shaft defining an axis of rotation for said impeller;

(e) said impeller housing defining an inlet through which molten metal from said reservoir is drawn upon rotation of said impeller, said inlet located in coaxial alignment with said impeller;

(f) a gas injection conduit in fluid communication with a source of purifying gas, including an output end disposed below the surface of molten metal, in proximity to the inlet; and,

(g) a gas injection means located at said inlet including means for receiving the output end of said gas injection conduit and a passage means communicating said output end with said inlet so that gas discharged by said conduit is injected and mixed with molten metal drawn into said inlet during rotation of said impeller, said gas reacting with impurities in said molten metal as said metal travels through said impeller chamber and outlet passage.

4,351,515

FEEDBACK CONTROL TYPE SHOCK ABSORBING SUSPENSION SYSTEM

Akio Yoshida, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

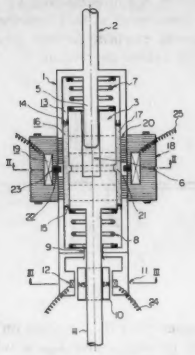
Filed Jun. 16, 1980, Ser. No. 159,518

Claims priority, application Japan, Jul. 2, 1979, 54-82566

Int. Cl.³ F16F *13/00, 15/03*

U.S. Cl. 267—8 R **8 Claims**

1. A feedback control type shock absorbing suspension system to be inserted between a body including a vibration source and a foundation for suspension of said body, which system comprises a suspending spring mechanism interposed between said body and said foundation, a sensor mechanism for detecting velocity of relative movement between said body and said foundation, a cylinder-piston mechanism including a cylinder connected to one of said body and said foundation and a piston connected to the other of said body and said foundation, a magnetic fluid or powder being held between the outer wall face of the piston and the inner wall face of the cylinder, an exciting coil for generating a magnetic flux for magnetizing said magnetic fluid or powder, and an electric circuit for applying a control voltage corresponding to the detected value of said sensor mechanism to said exciting coil, wherein at least two annular seal members are arranged in axially spaced relation between the outer wall face of the piston and the inner wall face of the cylinder, the space between said seal members constituting a sealed annular chamber, said chamber being filled with all of the magnetic fluid or powder between the



inner wall surfaces of the cylinder, and wherein the vibration-damping force between the cylinder and the piston is controlled by magnetization of said magnetic fluid or powder.

4,351,516

SWING CLAMP

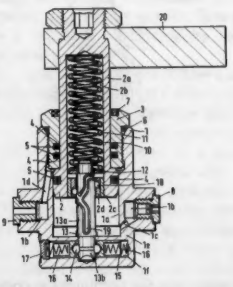
Metin Ersoy, Hilchenbach-Müsen, and Albrecht Weber, Hilchenbach, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Hilma GmbH, Hilchenbach, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,841

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031368

Int. Cl.³ B23Q *3/08*

U.S. Cl. 269—27 **9 Claims**



1. In a hydraulically actuatable swing clamp, particularly for clamping workpieces on a table of a machine tool, having a piston arranged within a housing, the piston rod of which extends in sealed manner out of the housing and carries a clamping arm, and which, in addition to an axial clamping movement, carries out a turning movement corresponding to a guide device, the turning movement effecting a swinging of the clamping arm, the guide device comprising a control bolt extending into the piston and being arranged normally non-rotatably on the housing, and at least one control curve, formed in a guide surface between the control bolt and the piston, having a helical curve section adapted for the swinging and simultaneous lifting movement and an axial section adapted for pure clamping movement of the clamping arm, and a guide member arranged on the piston or control bolt extending into the control curve, the improvement wherein

said guide member comprises at least two diametrically opposite and axially staggered guiding members,

said at least one control curve comprises at least two pairs of control curves,

each of said pairs of control curves comprises:

parallel extending axial sections; and

a left curve section constituting means for operatively effecting left-swinging rotation of the clamping arm in cooperation with said guide member, and a right curve section constituting means for operatively effecting right-swinging rotation of the clamping arm in cooperation with said guide member;

said left curve section and said right curve section of each of said pairs intersect each other and are axially staggered corresponding to said guiding members,

said left curve sections and said right curve sections of respective of said pairs are respectively opposite to each other.

4,351,517

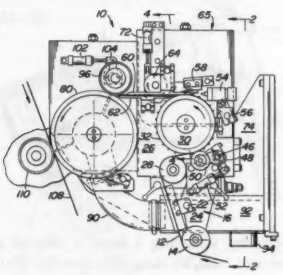
INSERT APPARATUS

Barry Neal, Malvern, and Timothy M. Morris, Coatesville, both of Pa., assignors to Mach-Neal, Inc., Malvern, Pa.

Filed Jul. 14, 1980, Ser. No. 167,955

Int. Cl.³ B65H *39/00*

U.S. Cl. 270—52 **8 Claims**



1. Card insert apparatus comprising a frame means, an applicator drum rotatably mounted on said frame means for sequentially applying cards to a moving web, means at a location adjacent said applicator drum for bursting a strip of cards into individual cards, an assembly moveable as a unit relative to said frame means tangentially toward and away from said applicator drum whereby the insert apparatus is adjustable to accept different length cards, said assembly including a common support for:

a. a feed roll for feeding a web in the form of a strip of connected cards to said applicator drum;

b. said bursting means including a burst roll spaced from a point on said applicator drum by a distance corresponding to the length of a card being processed and also spaced from said feed roll; and

c. a motor for driving said feed roll and means for driving said burst roll.

4,351,518

SUCTION-OPERATED DEVICE FOR FEEDING SHEETS ONE BY ONE TO A POINT OF UTILIZATION

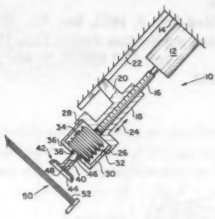
Emile Stievenart, c/o Matrix Instruments Inc., 230 Pegasus Ave., Northvale, N.J. 07647

Filed Dec. 16, 1980, Ser. No. 216,842

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—90 **3 Claims**

1. An improved suction-operated device for feeding sheets one by one to a point of utilization comprising a feed screw powered in rotation, an operative member in threaded engagement on said rotating feed screw operatively arranged to be urged in opposite descending and ascending directions along the rotation axis of said feed screw depending upon the direction of rotation thereof, a cooperating arrangement of a front, a rear, and side walls located adjacent the leading end of said operative member bounding a compartment, a suction cup operatively arranged to be projected from said compartment in facing relation to a supply stack of materials disposed in the path of movement of said operative member, and a bellows disposed in said compartment in an interposed position be-



tween said suction cup and said feed screw, whereby during said descending movement said rear compartment wall partially compresses said bellows and results in the suction attachment of said suction cup to a sheet of said supply stack and during said ascending movement said front compartment wall lifts said suction cup and results in a further compression of said bellows against said feed screw and thus the release of said sheet from the suction cup.

4,351,519

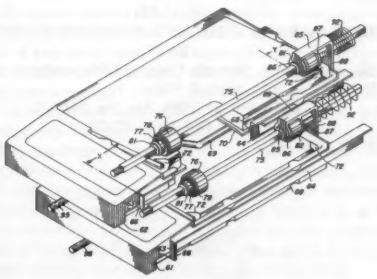
SHEET FEEDING APPARATUS

Rodney J. Jendrick, Newark, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1979, Ser. No. 70,598

Int. Cl.³ B65H *3/06*

U.S. Cl. 271—117 **10 Claims**



9. Sheet feeding apparatus comprising:

a rotatably driven feed roll shaft with a first feed roll fixedly mounted on said shaft;

a second feed roll axially movably mounted on said feed roll shaft;

means to axially move said second feed roll on said shaft;

a sheet cassette;

guide means for receiving and guiding said sheet cassette into feeding position with said feed roll shaft; said fixed feed roll being mounted on said shaft a fixed distance from a first side of said cassette;

said second feed roll on said feed roll shaft including means automatically responsive to the insertion and movement of a sheet cassette onto said guide means and into the feeding position on said guide means to axially move said second feed roll on said feed roll shaft to a position such

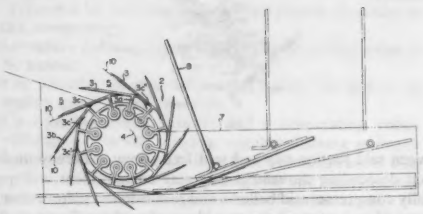
that said axially movable feed roll is positioned the same fixed distance from the opposite parallel side of said cassette.

4,351,520

STACKER APPARATUS FOR A CARD COUNTING MACHINE

Shigeru Tanaka, Matsudo, Japan, assignor to Musashi Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,572
Claims priority, application Japan, Feb. 19, 1980, 55/19194
Int. Cl.³ B65H *29/40*
U.S. Cl. 271—315 **4 Claims**



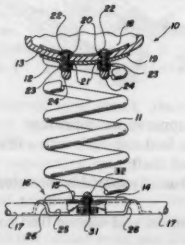
1. A stacker apparatus for a card counting machine comprising a rotary drum having a cylindrical outer surface supported for rotation in a predetermined direction, and a plurality of substantially "L" shaped arms provided in equispaced relationship around said cylindrical surface of said rotary drum, each of said arms having a root portion extending radially outwardly from said cylindrical surface, a first portion extending from the radially outward end of said root portion in a direction substantially opposite to said predetermined direction, and a second flexible portion extending from said radially outward end of said root portion toward said first portion of the preceding arm into soft contact with said preceding arm.

4,351,521

RIDING TOY FOR CHILDREN WITH SPRING SUPPORT BASE

William A. Erdos, Summit County, Ohio, assignor to Eagle Rubber Co., Inc., Ashland, Ohio

Filed Jun. 30, 1980, Ser. No. 164,822
Int. Cl.³ A63G *17/00*
U.S. Cl. 272—52 **6 Claims**



1. In a riding toy for children the improvement of a spring and base support structure for the riding toy having a body formed with a bottom wall, the improvement comprising:

(a) an upright spring member forming a vertical column having upper and lower ends;

(b) attachment means between the upper end of said spring and the bottom wall of the riding toy body;

(c) base means formed with a central raised area supporting said lower end of said spring member, said base means having flange means surrounding said central area at a lower level and formed with a plurality of inverted U-shaped semi-circular sockets opening outwardly from the space beneath said raised central area;

(d) elongated leg members having round portions in cross-section seated in said sockets and flattened inner ends projecting into the area under said raised central area of said base means;

(e) a single securing element connecting said flattened inner ends to said base means; and

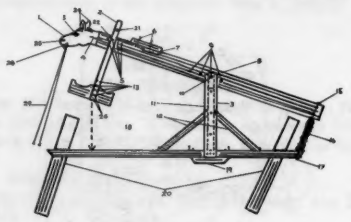
(f) a pair of elements in each socket engaged with said round portions of said leg members from opposite sides and below the major cross-sectional dimension of said round portions for retaining said leg members seated in snap fit relation in said respective sockets.

4,351,522

ADJUSTABLE TOY SPRING HORSE

Ben Marburger, 810 E. 48th St., Austin, Tex. 78751, and Marjorie Mogonye, P.O. Box 415, Elgin, Tex. 78621

Filed Aug. 4, 1980, Ser. No. 175,443
Int. Cl.³ A63G *17/00, 11/00*
U.S. Cl. 272—52 **1 Claim**



1. A hobby horse including a base, a support projecting upwardly from said base, an elongated member pivotally supported by said support about a horizontal axis with respect to the upper portion of said support, spring means biassing the rear end of said elongated member in a downward direction, a seat on said elongated member forward of said pivot axis, a combination hand and foot support mounted on said elongated member forward of said seat, means mounting said elongated member for longitudinal adjustment with respect to said pivot axis, means mounting said seat for adjustment longitudinally on said elongated member, means mounting said combination hand and foot support for longitudinal adjustment of said elongated member, and means mounting said foot support for vertical adjustment relative to the remainder of said combination hand and foot support whereby riders of various sizes and weights can be accomodated.

4,351,523

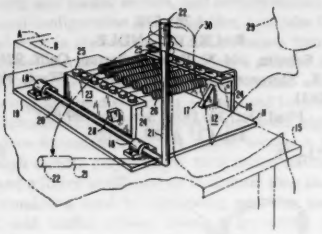
ARM WRESTLING EXERCISER

Glenn Alexander, 3218 N. Park Dr., Flagstaff, Ariz. 86001

Filed Nov. 10, 1980, Ser. No. 205,723
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—67 **1 Claim**

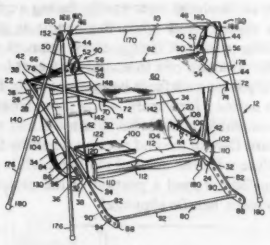
1. An arm wrestling exerciser, comprising, in combination, a base, a plate pivotally supported on said base, a handle affixed on said plate for being pivotally urged by a person, and a plurality of tension coil springs between said plate and said base for resisting a pivotal force by said person; opposite ends of said springs being attached to bolts supported on said plate and said base, said springs being selectively removable or addable, for adjusting a resistance force against said person; said base including a clamping bracket on its underside for clamping to a table; and a clip insertable over any of said

springs comprising a pair of toothed jaws insertable between spaced-apart turns of said spring, one said jaw being connected



to a threaded stem engaged in a threaded stem of the other said jaw.

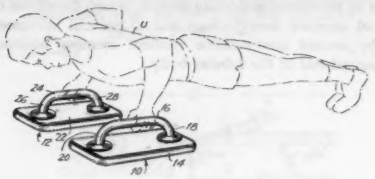
4,351,524
SWING
Daniel Gomes, 104½ E. Kirkwood, Apt. B, Bloomington, Ind. 47601
Filed Jul. 10, 1980, Ser. No. 168,198
Int. Cl.³ A63G *9/00*
U.S. Cl. 272—85 **15 Claims**



1. A swing, comprising a frame, a seat assembly including a sling forming at least one seat well and seat back, first and second elongated bars connected to opposed sides of the sling for engaging the frame, the frame including two elongated side members for supporting the sling therebetween, means for variably positioning each of the first and second elongated bars in at least two different positions relative to the ends of the side members to vary the depth of the seat well and the length of the seat back, the position of the first bar determining the depth of the seat well and the position of the second bar determining the length of the seat back, and suspension means for pivotally supporting the frame from an overhead support structure and for adjusting the inclination of the frame to recline the seat assembly, the suspension means including a pair of support strands connected to the frame on both sides of the seat assembly, a pair of pulleys each rotatably receiving one of the strands to allow movement of the strands, and adjustment blocks movably carried on each strand for establishing strand lengths between the pulleys and the frame to raise and lower portions of the frame and maintain a desired angle of inclination thereof.

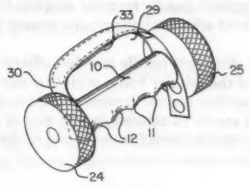
4,351,525
MULTIPLE USE EXERCISING DEVICES
William L. Rozenblad, 401 W. 56th St., New York, N.Y. 10019
Filed Feb. 23, 1981, Ser. No. 236,830
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—93 **3 Claims**

1. An exercising structure comprising at least one support, said support comprising a base and a generally U-shaped member having two ends mounted on said base, said U-shaped member being in generally upright inverted attitude on said base, said U-shaped member being tubular and said ends extending into said base, said structure further comprising inter-



nal elements in said ends and including projections extending at least partly through said base and locking members on the projections to clamp said U-shaped member to said base.

4,351,526
DUMBELLS
Leonard Schwartz, 3471 Fifth Ave., Pittsburgh, Pa. 15213
Filed Mar. 5, 1980, Ser. No. 127,474
Int. Cl.³ A63B *11/00*
U.S. Cl. 272—122 **5 Claims**



1. A dumbell structure particularly adapted for aerobic and related extended time type exercise comprising an elongate rigid body member having a soft, resilient outer covering at the central hand gripping portion thereof, a threaded portion at each end of said body member, a removable weight threaded on each of said threaded ends, and soft conformable hand engaging means engaged at each end of said rigid body member and extending outwardly transversely to said hand gripping portion and then generally parallel thereto to pass around and tightly conform to the back of the hand between the knuckles and wrist of a user, said central gripping hand portion and said hand engaging portion having sufficient resilience between and being spaced apart a sufficient distance so as to engage the hand of a user in such a manner that the structure is capable of being held on the hand without gripping by the fingers and without obstructing blood flow to the hand.

4,351,527
DOUBLE ACTING EXERCISER
Melvin L. Crisp, Jr., No. 4 Bales La., Ponca City, Okla. 74601
Filed Oct. 14, 1980, Ser. No. 196,698
Int. Cl.³ A63B *21/02*
U.S. Cl. 272—137 **9 Claims**

1. A double acting exerciser suited for exercising of the human body comprising:

(a) a tubular body having a first holding member on its first end;

(b) a first compressible resilient member disposed within the tubular body and prevented from passing from the first end thereof by the first holding member;

(c) a rod member having an abutting member on its first end which abuts against the first end of the first resilient member within the tubular body;

(d) a second compressible resilient member positioned in an annulus between the rod member and the tubular body;

(e) a second holding member positioned about the rod member and affixed to the second end of the tubular body such as to permit reciprocating motion in two directions of the rod member therethrough and to prevent movement of the second compressible resilient member beyond the second end of the tubular body;

(f) a first elongated handle member adapted for gripping by a human hand affixed at or near the second end of the rod member;

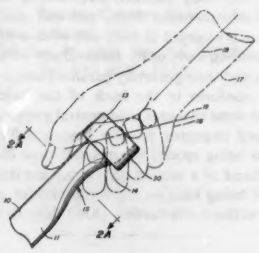
(g) a second elongated handle member affixed at or near the first end of the tubular body; such that movement of the handles together and movement of the handles apart both result in a stroke of suitable length and of suitable resistance in both directions for exercising of the human body.

4,351,528

SPORTS STICK HANDLE

Joseph R. Duplin, Winthrop, Mass., assignor to William H. Brine, Jr., Weston, Mass.

Filed Jul. 7, 1980, Ser. No. 166,498
Int. Cl.³ A63B *59/14*
U.S. Cl. 273—67 A **2 Claims**



1. A hockey stick comprising an enlarged axially extending main shank having a straight axis and defining a hand gripping end and another end having an angled blade extending therefrom,

said shank defining a polygonal cross-sectional outline at the gripping and an end retaining stop formed by a hand receiving notch recess within said cross-sectional outline disposed on the side of said axis opposite to that of said blade thereby permitting gripping of said shank end by the hand of a user with the axis of the shank substantially coaxial with the axis of the forearm and the hand in a relaxed gripping position with the gripping axis of the hand at an angle to the shank,

said notch recess being spaced from an end wall defined by said handle by a distance less than the hand span of a user, said notch recess being a curved cutaway of said shank cross section.

4,351,529

RACKET HANDLE

Edward C. Schultz, 304 N. Ford, Fullerton, Calif. 92623, and Robert K. Stevenson, 525 Princeton Cir. West, Fullerton, Calif. 92631

Filed Oct. 20, 1980, Ser. No. 199,072
Int. Cl.³ A63B *49/00*
U.S. Cl. 273—75 **9 Claims**

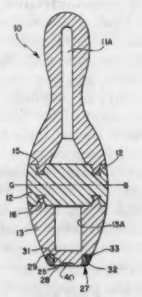
7. A game racket, comprising a stringed head defining a generally planar surface for striking a ball, a shank extending from the head, and an elongated handgrip handle extending from the shank to an end portion, the handle having top and bottom surfaces which are generally perpendicular to the planar surface of the head, rearwardly facing surfaces which face the palm of the hand when the handle is gripped, and forwardly facing surfaces facing away from the palm and generally in the direction of a forehand stroke, at least portions of the forwardly facing surfaces being outwardly flared at the end portion to define a forwardly facing shoulder at the handle end, and the remaining surfaces being smooth and substantially without outward flare in the end portion whereby the shoulder does not interfere with the palm of the hand while providing a bulged stop surface around a portion of the periphery of the handle end to assist handle slippage.

4,351,530

PLASTIC BOWLING PIN

Albert Bertozzi, P.O. Box 478, Pawtucket, R.I. 02860

Filed Oct. 27, 1980, Ser. No. 201,291
Int. Cl.³ A63D *9/00*
U.S. Cl. 273—82 R **2 Claims**



1. A plastic bowling pin, comprising three sections, a top section, a medial section and a bottom section, said three sections when assembled providing an outer contour of curvature corresponding to that of a conventional bowling pin, said top section having a hollow axial configuration and a shoulder, a circular flange and a rim in the lower end, said medial section having an upper circular recess provided with a key way

contour, and a lower circular recess provided with a second key way contour, means fastening said circular flange in said first mentioned key way contour with said shoulder and said rim abutting said medial section, said bottom section having a hollow axial configuration and a shoulder, a circular flange and a circular edge in the top end, a second means fastening said last mentioned circular flange in said lower circular recess key way contour with said last mentioned shoulder and circular edge abutting said medial section, the top and bottom sections being fabricated from approximately the same high density polyethylene formulation and the medial section is fabricated from a high density polyethylene formulation having greater density and a lower coefficient of restitution than the polyethylene formulation used in fabricating said top and bottom sections, said medial section having a horizontal strike line which is the center of gravity of the plastic bowling pin and the girth of said medial section and the circular flange on each of said top and bottom sections having structural characteristics resulting from having been fitted into said key way contours by having been melted during a spinning operation and cooled.

4,351,531

SEALING ARRANGEMENT FOR A PISTON PUMP

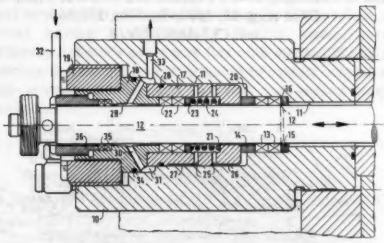
Wolfgang Maasberg, and Adalbert Huperz, both of Werthauser Str. 77-79, D-4100 Duisburg 14, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,576

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937459

Int. Cl.³ F16J *15/40, 15/48*

U.S. Cl. 277—22 **10 Claims**



1. In a high pressure piston pump, an improved sealing means in a clearance space between a cylinder and a plunger reciprocally movable therein comprising:

a first set of high pressure seals positioned forwardly in the direction of the discharge stroke of the pump plunger towards the discharge end of the cylinder;

a second set of high pressure seals separately supported at a spaced-apart location from said first set of seals, rearwardly along the length of the pump cylinder with respect to the discharge end thereof; and

a sleeve around the pump plunger inside of the pump cylinder having a predetermined annual clearance space around its external circumferential surface, and said sleeve defining a chamber around the plunger within which said second set of seals are enclosed, and said sleeve being in fluid communication with the pressurized fluid medium being pumped on both its internal and external surfaces, whereby said sleeve and said second set of seals enclosed therein are hydraulically pressurized radially inwards during the discharge stroke of the pump plunger.

4,351,532

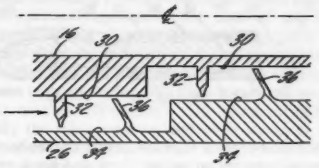
LABYRINTH SEAL

William F. Laverty, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 618,542, Oct. 1, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,157

Int. Cl.³ F16J *15/447*

U.S. Cl. 277—53 **6 Claims**



1. For preventing the leakage of a fluid medium between two components of a machine which are mounted for relative rotation, a labyrinth seal having an upstream throttle aperture and a downstream throttle aperture disposed in series relationship wherein said labyrinth seal further includes flow turning means operatively positioned between the upstream and downstream throttle aperture for directing leakage flow from the upstream aperture into opposing relationship to flow approaching the downstream aperture.

4,351,533

FACE SEAL WITH ROTATABLE SEAL RING

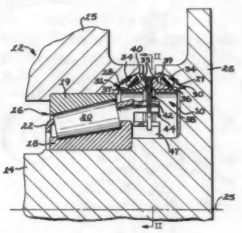
John A. Moore, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00766, § 371 Date Jun. 5, 1981, § 102(e) Date Jun. 5, 1981

This PCT application filed Jun. 5, 1981, Ser. No. 287,540

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—83 **14 Claims**



1. A face seal assembly **(10)**, comprising:

a pair of opposed annular seal faces **(36,37)** disposed about an axis **(25)**, one of said faces **(37)** being rotatable relative to the other of said seal faces **(36)**;

a seal ring **(38)** disposed between said seal faces **(36,37)** said seal ring **(38)** having opposite sealing faces **(39,40)** each in sealing contact with a respective one of said pair of seal faces **(36,37)**; and

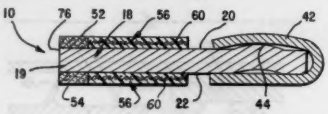
means **(44)** for rotating said seal ring **(38)** about said axis **(25)** at a speed proportionately less than the rotational speed of said one seal face **(37)**, said rotating means **(44)** being disposed about said axis **(25)** and including a portion **(22)** rotatable about said axis **(25)** at said lesser speed and means **(46,47)** for rotatably coupling said portion **(22)** to said seal ring **(38)**.

4,351,534

ABRASIVE-EROSION RESISTANT GASKET ASSEMBLY

Donald J. McDowell, Riverside, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed May 12, 1980, Ser. No. 149,036
Int. Cl.³ F16J *15/06*
U.S. Cl. 277—235 B **10 Claims**



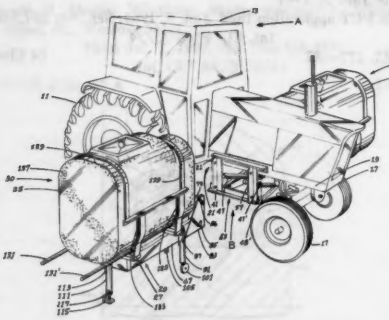
1. An abrasive-erosion resistant gasket assembly adapted to be positioned between an engine block and head, said engine defining at least one combustion chamber, said gasket comprising a main body portion including gasket base providing a first surface and a second surface and a composite facing material on each said surfaces, said gasket assembly defining at least one combustion opening, said gasket assembly further comprising a heat-resistant elastomeric body at each of two opposite ends of said gasket base, said elastomeric body being of a material different from the facing material and being deflectable in shear to deflect in response to relative movements of an engine block and head, thereby to resist abrasive erosion of said gasket assembly.

4,351,535

VERSATILE FAST HITCH SIDE MOUNTING OF AGRICULTURAL SPRAY TANKS

Harold C. Mead, Charles City, Iowa, assignor to Nixdorff Krein Industries, Inc., St. Louis, Mo.

Filed Dec. 24, 1980, Ser. No. 220,111
Int. Cl.³ B60P *3/030*
U.S. Cl. 280—5 R **13 Claims**



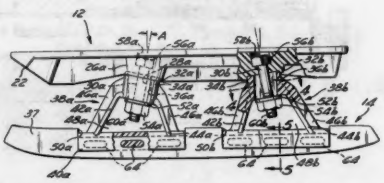
1. An apparatus for fast hitch tractor-side mounting of spray tanks or the like at opposite sides of an agricultural tractor, said apparatus comprising a carry-through frame of truss configuration including means for securement of said carry-through frame beneath said tractor to frame members thereof, said carry-through frame being configured for supporting the weight of filled tanks on opposite sides of said tractor and transferring the weight of said tanks to said tractor frame members, said carry-through frame providing opposite ends proximate said tractor frame members, said opposite ends each including a pair of horizontally spaced apart upright frame members for providing points of securement for corresponding tank-carrying frames on opposite sides of said tractor, said points of securement being immediately proximate corresponding ones of said tractor frame members, each said tank-carrying frame being adapted for carrying at least one of said tanks and including a pair of spaced horizontal side frame members and at least one upright frame member carried by each of said horizontal frame members at one end thereof to provide a horizontally spaced apart pair of upright frame members having spacing therebetween corresponding to spacing between upright frame members of said carry-through frame, a tank saddle mounted upon and secured to each said tank-carrying frame for seating one of said tanks within said saddle, and means for providing initial interengagement of each said tank-carrying frame with said carry-through frame by downward movement, relative to said carry-through frame, of the end of each said tank-carrying frame by which connection is made to said carry-through frame, to provide pivotal interengagement of said carry-through frame with each said tank-carrying frame by defining a transverse pivot axis proximate a corresponding tractor frame member, said upright members of each of said carry-through and tank-carrying frames including a plurality of securement apertures aligning upon rotation of said tank-carrying frame upon said transverse pivot axis to permit rigid interconnection of said carry-through and tank-carrying frames by securement means received through the aligned apertures, whereby one end of each said tank-carrying frame initially may be rapidly and easily pivotally interengaged with said carry-through frame and subsequently the other end of each said tank-carrying frame may be raised to permit rigid, secure interengagement of each said tank-carrying frame with said carry-through frame.

4,351,536

ICE SKATE ATTACHMENT

Hector M. Sandino, 24451 Peacock St., El Toro, Calif. 92630

Filed Aug. 15, 1980, Ser. No. 178,362
Int. Cl.³ A63C *17/18*
U.S. Cl. 280—7.13 **1 Claim**



1. An ice skate device for attachment to a variety of roller skate foot plates of the type having front and rear bosses for the mounting of roller skate trucks, each said boss having an opening and an action pin passing therethrough, said device comprising:

an ice skating blade;

front and rear support members for attaching said blade to said roller skate foot plate, each said support member being of a one piece, unitary plastic molded construction and comprising:

U-shaped mounting means for mounting said blade;

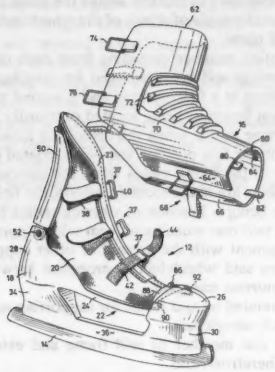
adaptor means engageable with said bosses and having an opening for receiving said action pin; and

strut means for connecting said adaptor means to said mounting means, said strut means forming a central opening to permit attachment of a fastener on said action pin for attaching said ice skate device to said roller skate foot plate can function interchangeably as a roller skate foot plate or as an ice skate foot plate.

4,351,537
MULTIPART SKATE

Sigurd Seidel, Graz, Austria, assignor to Warrington Inc., Mississauga, Canada

Filed Jan. 16, 1980, Ser. No. 112,686
Claims priority, application Austria, Jan. 19, 1979, 421/79
Int. Cl.[3] A63C 1/00
U.S. Cl. 280—11.12 12 Claims

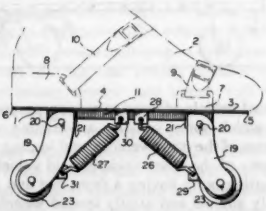


1. A skate for use as an ice skate comprising:
a rigid support structure comprising a sole portion, first and second support portions, an integral toe enclosing portion, an integral heel enclosing portion, and an integral blade portion fixed to said first and second support portions,
a relatively soft, flexible sock adapted to receive a skater's foot and adapted to be affixed to said sole portion of said support structure, and
a substantially rigid cover adapted to engage with said support structure to enclose and protect the skater's foot, said cover having a substantially flexible instep portion whereby a skater's ankle may flex with respect to said sole portion and having flanges adapted to extend beneath said sole portion and between said first and second support portions.

4,351,538
SPRING ASSISTED ROLLER SKATES

Sophia Berta, 224 Queensland Dr. SE., Calgary, Alberta, Canada

Filed Apr. 14, 1980, Ser. No. 140,216
Claims priority, application Canada, Feb. 5, 1980, 345048
Int. Cl.[3] A63C 17/02
U.S. Cl. 280—11.26 2 Claims

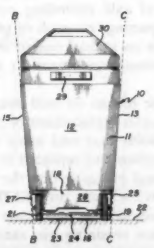


1. A roller skate comprising plate means for connecting the skate to the heel and toe ends of the foot of a user; first arm means comprising a pair of arms inclined with respect to the vertical and extending substantially downwardly and relatively slightly forwardly from the bottom of the toe end of said plate means; second arm means comprising a second pair of arms inclined with respect to the vertical and extending substantially downwardly and relatively slightly rearwardly from the heel end of said plate means; means pivotally interconnecting the top end of each said arm to said plate means for rotation around a horizontal axis; roller means on the bottom end of each of said arms; first tension spring means interconnecting said plate means and said first arm means, said first tension spring means extending from a point on said plate means intermediate the pivotally connected top ends of said first and second arm means to a point on the rear edge of said first arm means intermediate the ends thereof but substantially closer to the bottom end than the top end thereof; and second tension spring means interconnecting said plate means and said second arm means, said second tension spring means extending from substantially the same point on said plate means as said first spring means to a point on the front edge of said second arm means intermediate the ends thereof but substantially closer to the bottom end than the top end thereof, said tension spring means biasing said first and second arm means to said inclined positions such that said roller means are disposed relatively substantial distances below their respective arm pivot connections but relatively small distances respectively forwardly and rearwardly of their respective arm pivot connections, so that when the arms are pivoted away from each other and inclined to a greater extent by downward forces during jumping, the tension springs facilitate jumping by tending to return pivot the arm means toward each other to the original, less inclined positions, the areas below said plate means and respectively forward and rearward of said first and second arm means being free of obstructions in the pivot paths of the arm means so as to permit substantial pivotal movements of said arms respectively forwardly and rearwardly and upwardly against the bias of said spring means, and said first and second pairs of arms being arcuately curved so as to be concave forwardly and rearwardly, respectively wherein said plate means includes a front panel for supporting the toe end of a foot; a rear panel for supporting the heel end of a foot, and means extensibly interconnecting said front and rear panels, so that the length of the plates means can be adjusted to suit the foot of the user, said first and second tension spring means being connected to said front and rear panels, respectively.

4,351,539
TRASH BARREL

Michael S. Rodolakis, Worcester, Mass., assignor to AMS Industries, Inc., Worcester, Mass.

Filed Jul. 30, 1980, Ser. No. 173,768
Int. Cl.[3] B62B 1/00
U.S. Cl. 280—47.26 4 Claims



1. Trash barrel, comprising:
(a) a single-piece plastic container having four upper tapered side walls, four lower tapered side walls which are generally extensions of the upper side walls, but are spaced inwardly of and parallel with the upper side walls, and a bottom surface, said four lower side walls forming a downwardly-extending pedestal adapted to engage the ground, and an abutment extending laterally from the

pedestal, the bottom of said abutment being higher than the bottom of the pedestal, and the opposite outer side surfaces of the abutment being spaced inwardly of the respective outer opposite side surfaces of the pedestal, and

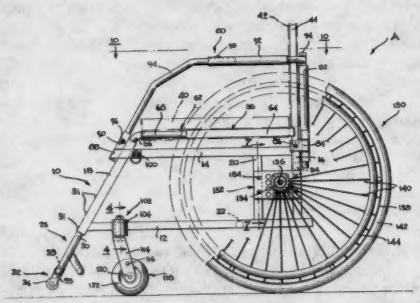
(b) a pair of wheels rotatably mounted on the opposite side surfaces of the abutment, the wheels being generally tangential to a ground plane including the bottom of the pedestal and lying entirely within an envelope defined by the planes of the outer surfaces of the upper side walls and the ground surface, so that, when the trash barrel is nested with other identical trash barrels, the trash barrel is supported by contact of its upper side walls only with the upper side walls of the next lower trash barrel and the wheels do not contact the lower side walls of said next lower trash barrel.

4,351,540

WHEELCHAIR CONSTRUCTION

Jeffrey P. Minnebraker, Oxnard, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Filed Nov. 13, 1980, Ser. No. 206,346
Int. Cl.³ A61G 5/02
U.S. Cl. 280—242 WC **47 Claims**



47. A wheelchair comprising:

(a) a main frame,

(b) a first pair of connected and spaced apart plates attached to one side of said frame and a second pair of connected and spaced apart plates attached to an opposite side of said frame,

(c) a plurality of axle receiving openings on each of said spaced apart plates and openings in each of the plates of a pair being aligned to be capable of receiving a rear wheel axle in each of said axle receiving openings,

(d) a rear wheel axle extending outwardly from the rear wheel axle openings on each of said pairs of plates,

(e) flange means on at least one of the plates of each of said pairs for fastner attachment to a frame means of said wheelchair,

(f) quick release means on said rear wheel axle to enable quick release and replacement of rear wheels on said rear wheel axle, such that said axles can be easily removed from one location and replaced in another axle receiving location on said plates so that the response and center of gravity and wheel base on said frame can be easily and quickly altered, said quick release means comprising:

(1) at least one retaining pin extending outwardly from said axle and capable of being retracted therein to permit removal of a wheel on said axle,

(2) manually actuable means on said axle for causing said retaining pin to be retracted upon actuation of said manually actuable means,

(g) a pair of wheel post housings on said frame means,

(h) a post extending vertically downwardly from each of said wheel post housings and being rotatable with respect to the associated post housing,

(i) a separate bracket carried by each of said posts and being rotatable about a generally vertical axis relative to the associated wheel post housing, and each of said brackets having a pair of spaced apart plates with a plurality of pairs of vertically spaced apart aligned apertures in said spaced apart plates,

(j) a separate wheel assembly for each said bracket and each wheel assembly being comprised of a wheel and an axle capable of being disposed in any of the plurality of pairs of aligned apertures to thereby adjust the plane of the frame and hence the angle of attack of the wheelchair relative to a ground plane,

(k) a mounting member extending from each of the wheel post housings and being adapted for attachment to said frame means in a first position and a second position, the wheel post housings being located outwardly of the sides of the frame means when the associated mounting members are in the first position and being located inwardly of the sides of the frame means when the associated mounting members are in the second position, the first or second positions being a function of steering radius and steering stability, said rear wheels and front wheels normally being in engagement with the ground or other supporting surface when said wheelchair is propelled forwardly or in turns in normal transport,

(l) a seat mounted on said frame for supporting an individual using such wheelchair,

(m) a foot rest member of said frame and extending forwardly therefrom, and

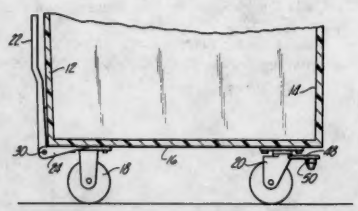
(n) a pair of rollers on said foot rest member and normally being spaced above the ground or other supporting surface a relatively sight distance above the lower ends of said front wheels when said wheelchair is used for normal transport, said wheelchair capable of being tipped by the user thereof so that said rear wheels are temporarily raised a relatively slight distance from the ground or other supporting surface and said rollers are lowered into engagement with the ground or other supporting surface.

4,351,541

VEHICLE TOWING SYSTEM

Robert L. Propst, Bellevue, Wash., and William B. Raftery, Grandville, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Apr. 25, 1980, Ser. No. 143,907
Int. Cl.³ B60D 7/00
U.S. Cl. 280—408 **3 Claims**



1. A wheeled vehicle adapted to be incorporated in a train of vehicles in which some vehicles are trailing vehicles with respect to some of the other vehicles and leading vehicles with respect to some of the other vehicles, said vehicle comprising a load-supporting body having a front end and a back end, a pair of axially aligned and axially spaced wheels fixed to the underside of said body adjacent said back end, a caster wheel assembly secured to the underside of said body adjacent said front end, coacting means on said body and said caster wheel assembly operable to releasably connect a trailing vehicle to an identical leading vehicle so that movement of said leading vehicle exerts a pulling force on said trailing vehicle applied at said caster wheel assembly, said coacting means comprising a

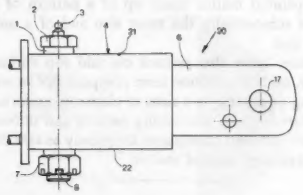
mounting bracket secured to the underside of said body, a wheel support member mounted for swivelling movement about an upright axis on said bracket, a caster wheel rotatably mounted on said support member, a forwardly extending flange on said wheel support member located above said caster wheel, a pin member extending downwardly from said flange adjacent the front end thereof, and a tongue member pivotally mounted on said vehicle back end having an opening at one end thereof, said tongue on a leading vehicle being movable between an upright stored position and a towing position wherein said opening in the tongue receives said caster wheel pin member on a trailing vehicle for applying said pulling force to the trailing vehicle and wherein said leading vehicle tongue is mounted on the leading vehicle by spring-loaded hinge means urging said leading vehicle tongue toward said upright position so that its coupling to the trailing vehicle is effected and maintained by the tongue opening being forceably urged onto the trailing vehicle pin member and the tongue against said flange.

4,351,542

FLEXIBLE TOWING HITCH

Robert Lovell, and Robert Vanos, both of 199 Parramatta Rd., Homebush, New South Wales, Australia (2140)

Filed Jul. 10, 1980, Ser. No. 167,363
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—489 **3 Claims**



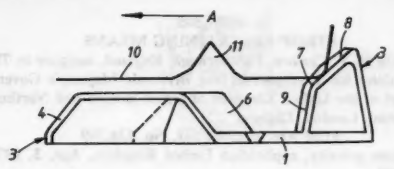
1. A towing hitch comprising a hollow housing having an upper and lower generally horizontal wall, said housing being fixed to a frame adapted to be attached to a vehicle, a towing force transmitting member to which a towed vehicle is to be coupled, a pivot attaching said member to said frame enabling said member to pivot about a generally horizontal axis through a predetermined angle and to extend generally horizontally outwardly of said hollow housing, and a resilient assembly means extending between said member and said frame biasing said member to a predetermined position relative to said housing, said assembly means including an upper and lower resilient member both abutting said towing member with said upper member extending toward said upper wall and said lower member extending toward said lower wall, an upper restraining plate member for said upper resilient member, said upper resilient plate member being generally horizontally disposed and sandwiched between said upper wall and said upper resilient member, a lower restraining plate member for said lower resilient member, said lower restraining plate member being generally horizontally disposed and sandwiched between said lower resilient member and said lower wall, tensioning means extending between said upper and lower plate members for applying a compressive force thereto so as to place said resilient members under compression so that said towing member is biased to said predetermined position within said housing.

4,351,543

DEVICE FOR PUSHING A FORWARDLY EXTENDING PORTION OF A SKI SHOE SOLE INTO A CROSS-COUNTRY SKI BINDING

Josef Linecker, Rosengasse 5, A-5230 Mattinghofen, Austria

Filed Mar. 12, 1980, Ser. No. 129,638
Claims priority, application Austria, Mar. 15, 1979, 1950/79
Int. Cl.³ A63C *9/00*
U.S. Cl. 280—615 **4 Claims**



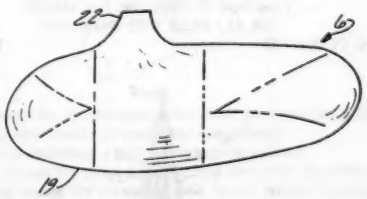
1. In combination with a cross-country ski binding mounted on a ski surface and arranged to receive a forwardly extending portion of a ski shoe sole comprising a heel portion opposite the forwardly extending portion: a device mounted on the ski surface for pushing the forwardly extending ski shoe sole portion into the binding, the binding being mounted on the ski surface closer to the point of the ski than the device and the device comprising an element having a sliding surface obliquely descending towards the ski surface in the direction of the ski point, the projected length of the sliding surface on the ski surface corresponding to the length of the path required for the forwardly extending ski show sole portion to be pushed into the binding for engagement therewith, and the sliding surface being adapted for gliding engagement with a corresponding surface of the shoe sole whereby the gliding engagement of the sliding and shoe sole surfaces pushes the shoe forwardly into the binding, the heel portion having a rear rim forming the corresponding shoe sole surface, and the element being arranged on the ski surface for gliding engagement of the rear rim with the sliding surface.

4,351,544

INFLATABLE APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Tsuneyo Ross, 22301 Winshall, St. Clair Shores, Mich. 48081

Division of Ser. No. 91,088, Nov. 5, 1979, abandoned, which is a division of Ser. No. 455,192, Mar. 27, 1974, Pat. No. 4,173,356. This application Mar. 6, 1981, Ser. No. 241,450
Int. Cl.³ B60R *21/08*
U.S. Cl. 280—743 **2 Claims**



1. A safety bag adapted to be inflated in a vehicle to cushion an occupant of the vehicle in a crash, having a deflated folded condition and an inflated unfolded condition, said bag comprising:

an air inlet nozzle; and

an elongated member extending across the front seat of the vehicle reaching at least from the passenger door to the driver in the unfolded condition;

said elongated member in a folded state being collapsed into a plane perpendicular to said nozzle and forming a plural-

ity of accordion style pleats inwardly directed from said elongated member ends toward said nozzle;

said nozzle being positioned closer to the driver for closer access to a source of air and defining a long portion and a short portion for said member in the unfolded state;

said pleats in said long portion extending transversely inward a greater distance then said pleats in said short portion.

4,351,545

STROP RESTRAINING MEANS

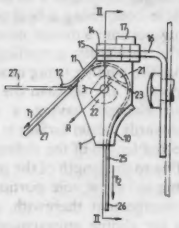
Kenneth H. F. Cardew, Farnborough, England, assignor to The Minister for Transport in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 2, 1980, Ser. No. 136,709

Claims priority, application United Kingdom, Apr. 3, 1979, 7911680

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **15 Claims**



1. Strop securing means comprising a housing containing a roller having a normal pivotal axis concentrically disposed in said roller, said normal pivotal axis having a fixed position relative to said housing, and means for eccentrically displacing said roller relative to said normal pivotal axis so that said normal pivotal axis is eccentrically disposed in said roller upon displacement, thereby pressing a strop passing around the periphery of said roller between said roller and a portion of said housing.

4,351,546

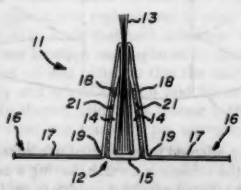
COVER FOR A CHANNEL CLIP BINDER AND METHOD OF MAKING SAME

Richard Cognata, 1268 Sacramento St., San Francisco, Calif. 94108

Filed Apr. 28, 1980, Ser. No. 144,393

Int. Cl.³ B42D *3/00*; B42F *9/00*

U.S. Cl. 281—45 **12 Claims**



1. In a method for covering a channel clip binder of the type wherein the marginal edges of a stack of leaves to be bound together are clipped between a pair of resilient side walls of a channel clip member having said side walls resiliently inwardly converging toward each other and upstanding in laterally spaced relation from an elongated integral base portion of the channel clip member, the steps of:

hinging together major and minor portions respectively of both front and back cover sheet portions of a cover, and

adhesively bonding the faces of said minor cover portions to the outer faces of the side walls of the channel clip member in mutually opposed face-to-face relation with the hinges of each of said front and back cover portions being disposed generally parallel to and adjacent said base portion of the channel clip member, whereby opening and closing the covered clip binder is facilitated.

4,351,547

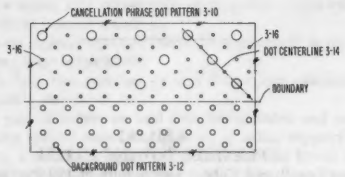
SECURITY DOCUMENT AND METHOD FOR MAKING SAME USING AN ALTERNATING DOT PATTERN

David L. Brooks, II, Fairport, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 11, 1979, Ser. No. 83,763

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—8 R **7 Claims**



1. An improved security document comprising:

a substrate having a top surface for carrying indicia;

background printed matter on said top surface, said background printed matter made up of a pattern of small elements of substantially the same size and of a uniform frequency; and,

a cancellation term also printed on said top surface of said substrate, said cancellation term composed of an area pattern consisting of at least two sizes of elements uniformly spaced in an intermingling, alternating pattern and occurring with the same combined contiguous frequency as said elements of said background printed matter.

4,351,548

METHOD OF CONSTRUCTING TIRE AND IDENTIFICATION TAG THEREFOR

Alan E. Cohn, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 10, 1980, Ser. No. 205,139

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—21 **3 Claims**

1. An identification paper tag having a surface area of one of its two sides in the range of about 2 to about 30, preferably about 5 to about 16 square inches (in^2) and having an information-providing ink composition thereon which covers about 10 to about 50, preferably about 20 to about 40 percent of the surface area of at least one side of said tag where said ink composition contains about 5 to about 25, preferably about 8 to about 15 weight percent, based on the total ink composition, of a heat activatable blowing agent.

4,351,549

MANDREL CLAMP ASSEMBLY

Frank E. Williams, and Alfred D. Story, both of Danville, Ill., assignors to Teepak, Inc., Chicago, Ill.

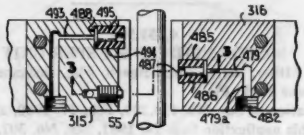
Filed May 8, 1980, Ser. No. 147,773

Int. Cl.³ F16L *41/00*

U.S. Cl. 285—27 **11 Claims**

1. A sealing member for forming a seal with the exterior of

a cylinder member around a radial bore therethrough, said sealing member comprising a sleeve of resiliently deformable material particularly adapted to be received in a bore in a support and having a seal forming end, and a collapse preventing member telescoped within said sleeve beginning at the end of said sleeve opposite from said seal forming end and terminating adjacent to but short of said seal forming end, said collapse preventing member having an axial flow bore extending entirely therethrough, and said axial flow bore having an internally threaded portion accessible to an externally threaded tool from said seal forming end for receiving such a threaded tool to facilitate removal of said sleeve from a support bore.



4,351,550

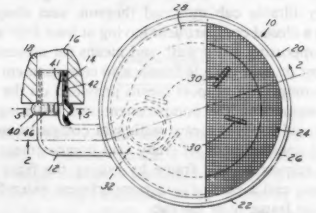
METAL-TO-PLASTIC PIPE JOINT

David L. Anderson, Muskegon, and A. David Joseph, North Muskegon, both of Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Division of Ser. No. 52,667, Jun. 27, 1979, Pat. No. 4,224,161, which is a continuation-in-part of Ser. No. 906,256, May 15, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 132,875

Int. Cl.³ F16L *33/20*

U.S. Cl. 285—158 **3 Claims**



1. A pipe end assembly adapted to be received by press-fit into sealed fluid communication with a substantially cylindrical opening, said pipe end assembly comprising a pipe of plastic material having a pipe end and a circumferential rib around an outer surface of said pipe spaced from said pipe end, and a one-piece metal eyelet having coaxial cylindrical portions respectively disposed internally and externally of said pipe end and a flanged skirt portion at one end of said external cylindrical portion sealingly capturing said rib to hold said eyelet on said pipe end, said external portion having a uniform outer surface adapted for sealing press-fit into a substantially cylindrical opening, said rib and said flanged skirt portion projecting radially outwardly from said surface to limit press-fit into the opening.

4,351,551

BALE TWINE KNOTTER WITH ADJUSTABLE WIPER

Michael J. Verhulst, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 25, 1980, Ser. No. 172,307

Int. Cl.³ A01D *59/04*; B65H *69/04*

U.S. Cl. 289—2 **2 Claims**

1. In a twine knotter for a crop baling machine comprising:

a rotatably mounted billhook for forming a loop of twine thereabout;

a wiper arm comprising:

(a) a fork defined by a pair of fingers for receiving and guiding twine therebetween; and

(b) a wiper extending transverse to said fingers, the improvement comprising:

(c) at least one transversely extending slot formed in said wiper; and

(d) screw means extending through said slot for releasably fixing said wiper to said arm, said wiper transversely movable back and forth relative to said fork.

4,351,552

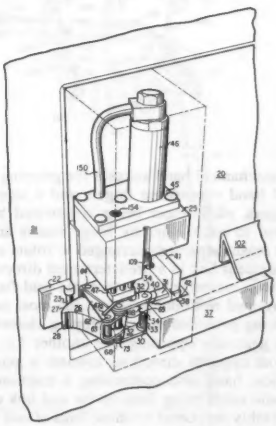
EMERGENCY EXIT DOOR LATCHING AND LOCKING APPARATUS

Roy E. VanDerLinden, New Windsor, Md., assignor to Reliable Security Systems, Inc., Cockeysville, Md.

Filed Mar. 20, 1979, Ser. No. 22,110

Int. Cl.³ E05C *15/02*

U.S. Cl. 292—201 **32 Claims**



1. A latch for an emergency exit door door said latch being operable from inside an enclosure comprising:

bolt means including a bolt for engaging a strike;

support means for supporting the bolt means on the door;

mounting means for mounting bolt means on the supporting means for movement between a projected position in which the strike is engaged and a retracted position in which the strike is bypassed by the bolt;

toggle means pivoted at one end to the support means and at the other end of the bolt means at a point on the bolt means, which toggle means is moveable between a first position in which the toggle means dogs the bolt means in the porjected position and a second position in which the toggle means allows the bolt to move to the retracted position, the toggle means including means for biasing the toggle means to the first position for holding the bolt projected;

delay means connected to the toggle to delay movement of the bolt from the projected to the retracted position after the toggle has been moved from the first position to the second position;

operating means mounted on the support means for moving the toggle means from the first position to the second position, whereby when pressure is thereafter applied to the door the bolt will be moved to the retracted position by the strike;

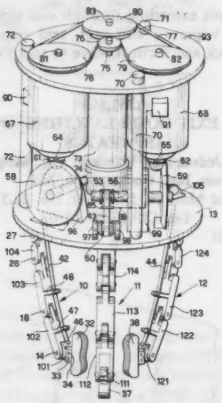
means on the door and responsive to pressure on the door for indicating that an attempt has been made to open the door.

4,351,553

MULTI-PURPOSE MECHANICAL HAND

Alberto Rovetta, Mich.LAN; Ilario Franchetti, San Vittore Olona, and Pietro Vicentini, Rho, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed Sep. 10, 1980, Ser. No. 186,201
Claims priority, application Italy, Sep. 19, 1979, 25817 A/79
Int. Cl.³ A61F *1/06*
U.S. Cl. 294—106 **7 Claims**



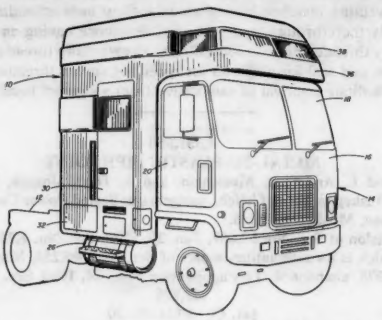
1. A mechanical hand suitable for gripping pieces, said mechanical hand comprising fingers and a support element for said fingers, each finger being constituted by a set of links connected to each other by hinge means and by preloaded resilient means separately arranged to rotate each link relative to the adjacent link in a predetermined direction until it abuts against stop means in order to cause said finger to assume a predetermined rest configuration, the most outer link of each finger being provided with a gripping element, said gripping element generally opposing one another for gripping an element from opposite directions towards a general center, said mechanical hand also comprising a traction cable for each finger, said cable being fixed to the end link of the finger and being slidably supported by those links of said finger which are able to rotate in a direction which is opposite the direction of rotation imposed by said preloaded resilient means; said mechanical hand also comprising actuator means operationally connected to the finger traction cables, said actuator means being capable of subjecting said cables to traction in order to displace the links of each finger from their rest configuration and to cause them to rotate in the direction opposite to the direction of rotation imposed by said resilient means, so causing the gripping element of each finger to rest on the piece to be gripped, said actuator means being also capable of locking said cables when under traction in order to keep the links of each finger in their working configuration with the piece gripped by the gripping elements of the fingers, said actuator means being finally able to nullify the traction force on said cables in order to enable the links of each finger to return to their rest position under the action of said preloaded resilient means, for each finger there being provided a sensor for sensing the traction force to which the relative cable is subjected, said mechanical hand also comprising control means for said actuator means including threshold comparator means operationally connected to said sensors, said threshold comparator means causing the actuator means to lock said cables under traction when a predetermined value of the traction force is attained.

4,351,554

MOTOR VEHICLE SLEEPER UNIT

Gene H. Miller, North Palm Beach, Fla., assignor to Livlab, Inc., Lake Park, Fla.

Continuation of Ser. No. 125,289, Feb. 27, 1980, abandoned.
This application Sep. 14, 1981, Ser. No. 302,173
Int. Cl.³ B62D *25/00*; B60P *3/32*
U.S. Cl. 296—24 R **21 Claims**



1. A sleeper unit for a motor vehicle including a frame with a forwardly tiltable cab mounted thereon, said sleeper unit comprising a closed compartment having at least four upstanding walls supporting a top wall, and means for mounting said compartment on said vehicle frame; said compartment mounting means comprising support means provided on the vehicle frame for supporting the compartment and fastening means connecting said support means with said compartment at the rear of said compartment whereby said compartment can be tilted with respect to said frame by raising the front of said compartment; and a part of said compartment extending forwardly of the frame over the cab.

4,351,555

FOLDABLE PANEL FOR AN AUTOMOTIVE VEHICLE

Akihiro Hashimoto, Kokubunji, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 23, 1979, Ser. No. 41,771
Claims priority, application Japan, May 31, 1978, 53-65178
Int. Cl.³ B60R *5/04*
U.S. Cl. 296—37.16 **5 Claims**

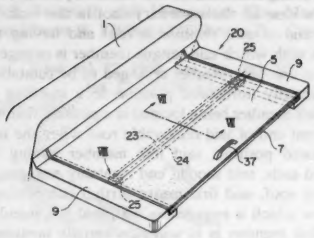
1. A foldable panel for the storage area of an automotive vehicle having a panel supporting structure, comprising:

an outer layer;

a first plate and a second plate which are covered by said outer layer and which have inboard edges spaced from each other;

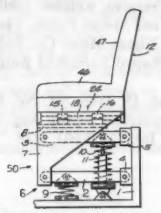
a generally "U"-shaped member having integral first and second spindles, said first spindle being rotatably connected to said first plate and said second spindle being rotatably connected to said second plate, first and second reinforcement members secured to said first and second plates, respectively, at portions adjacent said inboard edges, said reinforcement members being formed with envelope sections, respectively, for receiving said first and second spindles, respectively, the distance between the axis of said first spindle and the axis of said second spindle

being greater than the sum of the distances between the axis of said first spindle and the upper surface of said outer



layer and between the axis of said second spindle and said upper surface of said outer layer.

4,351,556
SEAT SUSPENSION
Thomas J. Worringer, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Dec. 20, 1979, Ser. No. 105,631
Int. Cl.³ B60N *1/00*
U.S. Cl. 296—63 **10 Claims**



1. A horizontal vehicle seat suspension system on a vehicle comprising, a vehicle chassis, a seat, a seat suspension system on said vehicle chassis permitting horizontal movement of said seat relative to said chassis including, an inertia lever pivotally mounted on said vehicle chassis, resilient means normally biasing said inertia lever to a neutral position, a latch means selectively and alternatively connecting said inertia lever to said seat and locking said seat to said chassis, said suspension system thereby causing inertia forces and spring forces to absorb vibration energy with a minimum of vibrations being transmitted across said suspension system at predetermined frequencies from said chassis to said seat.

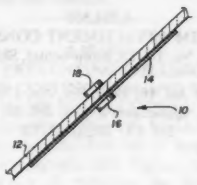
4,351,557
LIGHT SHIELD FOR VEHICLES HAVING TRANSPARENT MEMBERS
Rajagopala M. N. Chary, 5400 Windy Meadow Dr., Arlington, Tex. 76017
Filed Jul. 14, 1980, Ser. No. 167,818
Int. Cl.³ B60J *3/02*
U.S. Cl. 296—97 D **17 Claims**

1. A light-blocking device adapted for use in vehicles having transparent members such as glass windshields or windows, comprising:

(a) a shield in the form of a relatively stiff and generally flat sheet having sufficient opacity to at least serve as a light-filtering medium;

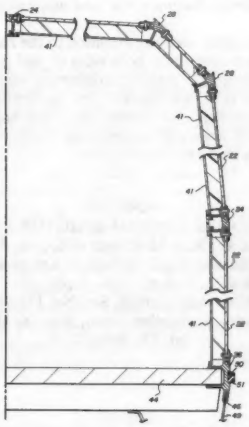
(b) a first magnet affixed to one side of said shield, and said magnet having a size appreciably smaller than said shield, and said magnet being affixed in such a way that the shield may lay generally flush against the inside surface of the transparent member; and

(c) a second magnet adapted to be placed on the outside of the vehicle's transparent member in a position so that it is juxtaposed with the first or interior magnet, and the first and second magnets respectively having a magnetic orien-



tation such that their confronting faces have opposite polarities, with the result that the two magnets are attracted to each other and the shield is held adjacent the transparent member by the interacting magnetic fields of the two magnets, and each of the magnets having a minimum magnetic strength of about 800 gauss.

4,351,558
TRUCK BODY CONSTRUCTION
Frederick N. Mueller, 7637 El Pastel, Dallas, Tex. 75240
Filed Apr. 23, 1979, Ser. No. 32,390
Int. Cl.³ B62D *27/02*
U.S. Cl. 296—187 **7 Claims**



1. A vehicle body comprising:

(a) a plurality of exterior planar panels forming the top, front, side and rear of the exterior vehicle body;

(b) a floor;

(c) fastening members for securing said panels, said fastening members having a first exterior panel slot for securing one panel and a second exterior panel slot for securing another of said exterior panels with said exterior panels being secured in a predetermined configuration, said configuration determined by the relation of said first and second exterior panel slots, said exterior panel slots being dimensioned for insertion of exterior panels therein, said fastening members also including at least one inwardly projecting member including flange means for securing at least one interior panel in approximately parallel relationship to a corresponding exterior panel; and

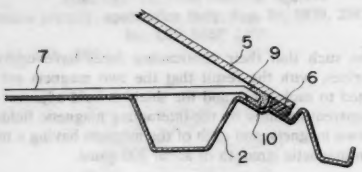
(d) floor fastening members for securing the floor to selected ones of said exterior panels of the vehicle body, said floor fastening members having the slot for allowing insertion therein of said selected ones of said exterior panels, and inwardly projecting members forming a channel to allow insertion therein of the floor and a downwardly projecting slot for allowing insertion of a skirt therein.

4,351,559

PARCEL TRIM ATTACHMENT CONSTRUCTION

Masaki Sugisawa, No. 1-1-15, Kami-ochiai, Shinjuku-ku, Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,316
Claims priority, application Japan, Jul. 30, 1979, 54-97475
Int. Cl.³ B62D *25/08*
U.S. Cl. 296—195 **3 Claims**



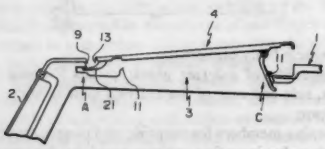
1. An automobile parcel trim attachment construction comprising:
(a) a parcel panel;
(b) a rear window glass bonded to said parcel panel;
(c) said rear window glass and said parcel panel oriented and positioned to form a space therebetween in front of the bond location;
(d) a parcel trim having a rear end inserted into said space; and
(e) an elastomeric member mounted to the rear edge of said parcel trim contacting both sides of said parcel trim;
(f) said elastomeric member contacting said rear window glass and said parcel panel, and resiliently holding said parcel trim rear end in said space, and holding said rear end spaced from and out of direct contact with said window glass and said parcel panel.

4,351,560

REMOVABLE ROOF OF A MOTOR VEHICLE

Noboru Kanou, and Keiji Mori, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 1, 1980, Ser. No. 174,627
Claims priority, application Japan, Aug. 16, 1979, 54-103523
Int. Cl.³ B60J *7/18*
U.S. Cl. 296—216 **27 Claims**



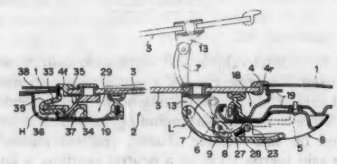
1. In a roof structure of a motor vehicle having a stationary roof that has front and rear ends and an opening formed in a region intermediate the front and rear ends, and a removable roof removably mounted on the stationary roof above the opening and having a contour shape that corresponds to the contour shape of the opening and having a front end and a rear end, the invention comprising:
first means for securing the front end of said removable roof to the stationary roof, said first means comprising at least one tongue member located on the front end of said removable roof and extending substantially horizontally towards the front end of said stationary roof, at least one hollow case on the stationary roof in the vicinity of the front end of said removable roof and having therein a recess with which said tongue member is engageable, and at least one link member arranged to be rotatable from a substantially horizontal position to a standing position, said link member being located in a position that is beneath the front end of said removable roof when the latter is in its closed position, said link member having first and second ends, said second end rotatably engaging the stationary roof, said first means further comprising a latch groove which is engageable with said link member when said link member is in said substantially horizontal position, the direction in which said latch groove is open being such as to release said link member only when the rear end of said removable roof is pivoted upward and forward; and
second means arranged on the stationary roof and cooperating with the rear end of said removable roof for securing the rear end of said removable roof to the stationary roof.

4,351,561

LOCKING DEVICE FOR AN OPENABLE AUTOMOBILE ROOF

Yoshimasa Tuchiya, Sayama; Katsumi Ishii, Tokyo; Toshiharu Iidaka, Funabashi, and Masao Fujita, Yamatsurumachi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohamashi and Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 15, 1980, Ser. No. 178,680
Claims priority, application Japan, Aug. 18, 1979, 54-104527
Int. Cl.³ B60J *7/18*
U.S. Cl. 296—216 **4 Claims**

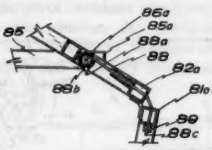


1. A locking device for an openable automobile roof panel comprising:
a base plate fixed to the edge of an opening formed in the roof panel;
a pair of hook portions provided at one end of said base plate;
a lid adapted to close the opening in the roof panel and cooperate with said hook portions of the base plate;
a handle pivotally supported by the edge of said lid corresponding to said hook portions;
a pair of links pivotally connected at one end thereof to said handle;
a shaft pin projected from the other end of each link and rotatably fitted in each hook portion to form a toggle connection;
a pair of stoppers retractably carried by said base plate, each of said stoppers adapted to resiliently block one of said hook portions and hold a respective one of said shaft pins therein; and
knobs disposed on both sides of said handle and interconnected to each other and adapted to operate said stoppers to retract by manipulation of either one of said knobs.

4,351,562
MOVABLE SEAT FOR A MOTORIZED TRANSPORT CHAIR

Brent L. Twitchell, 3451 W. 4400 South, Granger, Utah 84120; Kendel S. Twitchell, 1569 Shenandoah Cir., Murray, Utah 84107, and Brent W. Zitting, 4271 Charles Dr., Granger, Utah 84120

Filed Jul. 17, 1980, Ser. No. 164,707
Int. Cl.³ B62D *11/04*
U.S. Cl. 297—345 **9 Claims**



1. A movable seat for arrangement with a transport chair comprising,

a seat that includes a bottom and a back that is connected thereto by a hinge arrangement such that said back can be pivoted forwardly to engage said seat bottom;

a seat support means arranged with the transport chair for supporting said seat thereto;

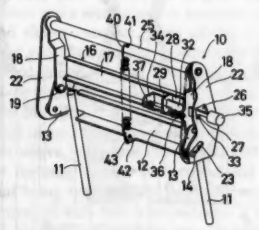
arm means fixed by connection means at ends thereof to the ends of an axle that is journaled across the seat back above said hinge arrangement; and

cable means secured on one end thereof to said seat back below said hinge arrangement with the other cable means and wound around and secured to said axle, said cable means being drawn taut to prohibit axle rotation during rotation of said seat back to maintain said arm means in essentially a parallel attitude over said seat bottom.

4,351,563
HEADREST FOR VEHICLES

Takemi Hattori, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 20, 1980, Ser. No. 179,725
Claims priority, application Japan, Sep. 5, 1979, 54/113955
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—408 **5 Claims**



1. A headrest for vehicles having a seat backrest comprising:

a stay fixed to said seat backrest and including a projecting portion,

a bracket member fixed to said headrest, and including an elongated hole formed therein,

a link member pivotally supported by said stay at one end thereof and pivotally supporting said bracket member at an opposite end thereof,

said elongated hole provided in said bracket member serving to guide said projecting portion to move said bracket member,

regulating means disposed between said link member and said bracket member for regulating the inclination of said bracket member,

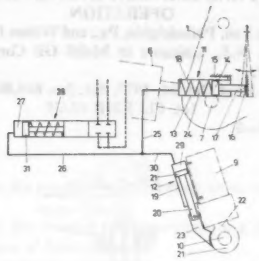
a reinforcing link member rotatably supported by said bracket member and including a reinforcing portion, and

a guide link portion pivotally supported by said stay at one end thereof and pivotally supporting said bracket member at the opposite side thereof.

4,351,564
DEVICE FOR PREVENTING COLLISION BETWEEN PART OF THE CUTTING ARM AND PART OF THE LOADING RAMP FOR A CUTTING MACHINE

Erich Dröscher, Scheifling; Hans P. Pfundner, Weisskirchen, and Herwig Wrulich, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Oct. 28, 1980, Ser. No. 202,001
Claims priority, application Austria, Nov. 5, 1979, 7097/79
Int. Cl.³ E21C *27/24*
U.S. Cl. 299—1 **6 Claims**



1. Device for preventing collision between a part of the cutting arm and a part of the loading ramp in a cutting machine comprising a pivotable cutting arm pivotable at least around one horizontal axis and carrying at least one cutting head and comprising a loading ramp arranged below the cutting arm and being designed to be lifted and lowered, characterized in that a transmitter means is provided for the cutting arm, said transmitter means registering the position of the cutting arm relative to the cutting machine, and a transmitter means is provided for the loading ramp, said transmitter means registering the position of the loading ramp relative to the cutting machine, and in that said both transmitter means are in connection with a common receiver means (28) controlling a switching member interrupting the downward movement of the cutting arm and the upward movement of the loading ramp in dependence on a combination of the signals of said both transmitter means.

4,351,565
ROOF SENSING CONTROL OF SHEARER IN LONGWALL MINING

Ken Takahashi, Tokyo, and Tsunetoshi Ito, Yokohama, both of Japan, assignors to Taiheiyo Engineering Inc., Tokyo, Japan

Division of Ser. No. 83,871, Oct. 11, 1979, Pat. No. 4,279,443.
This application Mar. 20, 1981, Ser. No. 245,807
Claims priority, application Japan, Jul. 13, 1979, 54-88090
Int. Cl.³ E21C *35/08*
U.S. Cl. 299—1 **3 Claims**

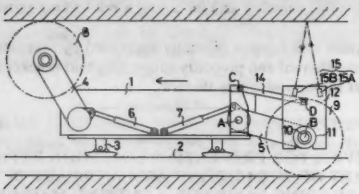
1. A mining method utilizing a mining apparatus having at least upper and lower cutting means, comprising

providing a position detector on said mining apparatus, said detector being vertically moved in association with vertical movement of said lower cutting means,

projecting signals from said position detector to measure distance from said position detector to a mine roof, and

vertically adjusting the position of said lower cutting means

in response to said signals of said position detector so that constant cutting height between the upper and lower



cutting means can be obtained when the upper cutting means is adjusted to cut along a seam.

4,351,566

METHOD AND APPARATUS FOR MIXING GASEOUS OXIDANT AND LIXIVIANT IN AN IN SITU LEACH OPERATION

Tsoung-yuan Yan, Philadelphia, Pa., and Wilton F. Espenscheid, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,863
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—5 **15 Claims**

1. A method of mixing a gaseous oxidant and a lixiviant at a downhole location within a well, said method comprising:

supplying said gaseous oxidant to a mixing zone near the lower end of said injection well;

trapping said gaseous oxidant within said mixing zone;

passing said lixiviant through said trapped gaseous oxidant within said mixing zone to mix said gaseous oxidant and said lixiviant; and

increasing the velocity of said lixiviant as it enters said mixing zone just prior to being passed through said trapped gaseous oxidant.

4,351,567

COWL-LIKE SCRUBBER FOR A LONG-WALL SHEARER

Gary R. Gillingham, Prior Lake, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

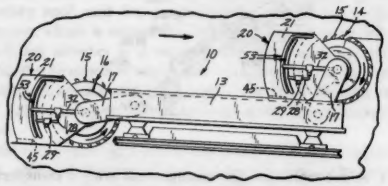
Filed Nov. 14, 1980, Ser. No. 206,708
Int. Cl.³ E21C *35/20*
U.S. Cl. 299—45 **14 Claims**

2. A water-powered dust scrubber adapted to be mounted on a long-wall shearer, said shearer having a cutter drum which generates large particulate material and dust particles, said scrubber comprising:

a housing;

means on said housing for mounting said housing in close spaced-apart relationship with a trailing side of said cutter drum;

means, proximate said trailing side of said cutter drum, for establishing dust-laden air movement through said housing in a direction away from said cutter drum trailing side including water jet sprays in said housing, said air movement means including a plurality of nozzles constructed and arranged across the depth and width of said housing



to direct high velocity, small diameter water droplets into said shearer-generated dust particles within said housing so as to entrain said dust particles within said water droplets, said jet spray air movement means also including a water supply means for said nozzles;

dust-laden mist removal means positioned downstream from and in fluid communication with said jet spray air movement means; and

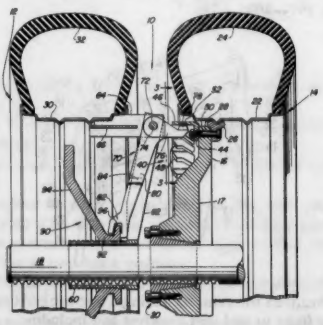
barrier means on said housing positioned behind said cutter drum trailing side and upstream from said jet spray air movement means for preventing larger particles from entering said housing with said dust-laden air.

4,351,568

WHEEL ATTACHING DEVICE

Brian A. Ahlschwede, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 2, 1980, Ser. No. 193,346
Int. Cl.³ B60B *11/02*
U.S. Cl. 301—36 R **18 Claims**



1. An attaching device for attaching an auxiliary wheel assembly to a vehicle-mounted wheel assembly, the mounted wheel assembly having a wheel fixed for rotation with an axle and a rim attached to the wheel for supporting a tire thereupon, the attaching device comprising:

support structure fixed for rotation with the auxiliary wheel assembly, the support structure comprising a hollow cylindrical member defining an axial bore therein for receiving the axle and a plurality of support members intercon-

necting the cylindrical member and the auxiliary wheel assembly;

a disc member attached to the wheel of the mounted wheel assembly for rotation therewith;

a plurality of pivot members each pivotally attached to a corresponding one of the support members and each with a disc-engaging portion; and

a coupling member mounted on an outer surface of the cylindrical member and engagable with the pivot members, the coupling member being movable with respect to the cylindrical member to pivot the disc-engaging portions of the pivot members into interlocking engagement with the disc member, the interlocked disc and pivot members and the support structure cooperating to cause the mounted and auxiliary wheel assemblies to rotate together.

4,351,569

HUB SLEEVE FORMED OF DEEP-DRAWN PARTS

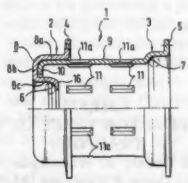
Werner Steuer, Schweinfurt, and Bernd Leiter, Hergolshausen, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 13, 1980, Ser. No. 121,118

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906627

Int. Cl.³ B60B *27/04*

U.S. Cl. 301—6 V **12 Claims**



1. Hub for a bicycle or the like comprising an axially extending hub sleeve body for receiving components used for at least the driving operation, said sleeve body having a first end and a second end spaced apart in the axial direction thereof and, comprising two coaxially arranged and connected sleeve members formed as deep-drawn components and consisting of a first sleeve member and a second sleeve member with each said first and second sleeve member being axially extending and having a first end and a second end, wherein the improvement comprises said first sleeve member having the shape of a cylinder extending approximately for the full axial length of said hub sleeve body from the first end to the second end thereof with the first end of said first sleeve member forming the first end of said hub sleeve body and the second end of said first sleeve member forming in part the second end of said hub sleeve body and being bent radially inwardly transversely of the axial direction of said hub sleeve body, a spoke flange formed on and extending laterally outwardly from said first sleeve member, said second sleeve member being formed cup-shaped at the second end thereof and with the first end thereof located between the first and second ends of said first sleeve member, at least an axially extending portion at the second end of said first sleeve member being fitted into said second sleeve member, the cup-shaped second end of said second sleeve member is bent radially inwardly in overlapping and surface contact with the radially inwardly bent second end of said first sleeve member and said second sleeve member having a spoke flange formed on and extending laterally outwardly therefrom and located between and spaced from the first end and second end of said hub sleeve body.

4,351,570

VEHICLE BRAKE PRESSURE PROPORTIONING VALVES

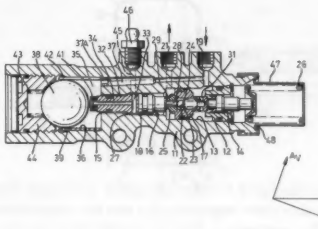
Alastair J. Young, Kenilworth, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Dec. 11, 1980, Ser. No. 215,430

Claims priority, application United Kingdom, Dec. 14, 1979, 7943238

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—24 F **12 Claims**



1. A vehicle brake pressure proportioning valve comprising:

a housing;

a inlet port in the housing for connection to a driver-controlled source of fluid pressure;

an outlet port in the housing for connection to rear brakes of the vehicle;

a stepped bore in the housing;

a stepped proportioning valve plunger slidable in the stepped bore and having one, relatively small, piston area subject to inlet pressure from the inlet port and another, relatively large, piston area subject to brake pressure at the outlet port;

a loading spring which applies a biassing load to the proportioning valve plunger in a direction opposing movement of the plunger under the action of brake pressure at the inlet port;

metering valve means associated with the proportioning valve plunger for controlling flow between the inlet port and the outlet port;

a control plunger slidable in the stepped bore and co-operating with the metering valve means such that relative movement of the proportioning valve plunger away from the control valve plunger changes the metering valve means from an open state permitting flow between the inlet port and the outlet port and a closed state preventing flow from the inlet port to the outlet port, the control plunger being movable with the proportioning valve plunger during movement of the proportioning valve plunger against the biassing load when brake pressure is increasing;

a liquid filled control chamber having a volume which varies with movement of the control plunger in the stepped bore;

a control passage connecting the inlet port and the control chamber;

a control mass movable in the housing under vehicle deceleration;

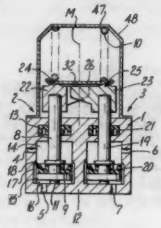
inertia valve means including the control mass for closing the control passage;

and control spring means for applying to the control mass a load which varies according to the distance moved by the control plunger before the control passage is closed.

4,351,571
DUAL-CIRCUIT PRESSURE CONTROL VALVES FOR BRAKE SYSTEMS

Bernd Schopper, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,339
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938104
Int. Cl.³ B60T *17/18, 11/08*
U.S. Cl. 303—40 17 Claims



1. A dual-circuit pressure control valve for a dual-circuit brake system comprising:

two control pistons disposed in a housing in a parallel side by side relationship, each of said two pistons being associated with a different one of said brake circuits; and

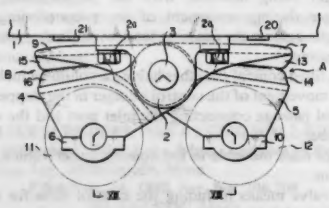
a common unguided preloading device acting on said two pistons through a distribution device and pressing said two pistons against a stop in their rest condition, said distribution device, in the event of a pressure failure in one of said brake circuits, increases the preload on said piston of the other of said brake circuits, said distribution device including

two tops each fastened to an adjacent end of a different one of said two pistons, each of said two tops having a supporting surface disposed coaxial of a longitudinal axis of an associated one of said two pistons abutting said preloading device and at least one additional supporting surface disposed in a slightly spaced relationship with said preloading device, said additional supporting surface extending beyond a first medial plane disposed between said two pistons.

4,351,572
TRACK ROLLER SUSPENSION APPARATUS FOR A TRACK-TYPE VEHICLE

Yasuo Fujiwara; Hidemi Maeo, and Eiichi Muramoto, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,282
Claims priority, application Japan, May 11, 1979, 54/57013
Int. Cl.³ B62D *55/16*
U.S. Cl. 305—27 3 Claims



1. A track roller suspension apparatus for a track-type vehicle having a track frame and a track assembly mounted on the track frame, said apparatus comprising:

a single shaft rotatably mounted on said track frame;

first arm means rotatably mounted on said shaft, said first arm means having a split roller mounting lower section and a single carrier upper section;

second arm means rotatably mounted on said shaft, said second arm means having a split roller mounting lower section, a single carrier upper section and an intermediate portion having an opening therethrough, said first and second arm means being arranged crossing each other at said shaft, with said first arm means passing through said opening on said second arm means where they cross;

first roller means rotatably mounted in the split of the roller mounting lower section of said first arm means;

second roller means rotatably mounted in the split of the roller mounting lower section of said second arm means;

first unitary resilient pad means mounted on the lower surface of the upper section of said first arm means;

second unitary resilient pad means mounted on the upper surface of the roller mounting lower section of said second arm means, said first and second resilient pad means facing each other and being adapted to collide;

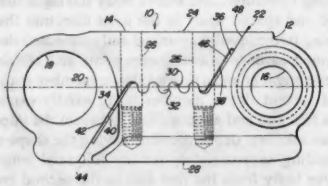
third unitary resilient pad means mounted on the lower surface of the upper section of said second arm means; and

fourth unitary resilient pad means mounted on the upper surface of the roller mounting lower section of said first arm means, said third and fourth resilient pad means facing each other and being adapted to collide.

4,351,573
SPLIT MASTER LINK FOR TRACK OF TRACK-LAYING TRACTORS

Michael Bedis, and Donald E. Westemeier, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 24, 1980, Ser. No. 219,625
Int. Cl.³ B62D *55/20, 55/28*
U.S. Cl. 305—54 8 Claims

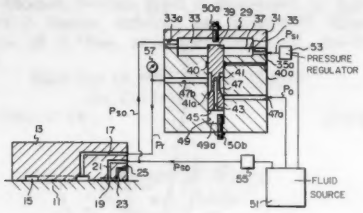


1. In an endless track split master link including an outer side adapted for receiving a track shoe and an opposite inner side, first and second separable link sections respectively having parallel pin and bushing bores extending therethrough, the first and second link sections having respective overlapped portions located between the pin and bushing bores and including respective inner and outer confronting surface portions forming continuations of respective intermediate interengaged serrated surface portions, the improvement comprising: said inner and outer confronting surface portions being inclined relative to a line of centers passing through said pin and bushing bores and spaced apart from each other in respective zones extending from the intermediate interengaged serrated surface portions towards the inner and outer sides of the link; and said inner and outer confronting surface portions being engaged with each other respectively inwardly and outwardly of said respective zones.

4,351,574
LOAD-COMPENSATED TYPE GUIDE MECHANISM ADAPTED FOR A MACHINE

Yuji Furukawa, Tokyo, and Makoto Sato, Kanagawa, both of Japan, assignors to Makino Milling Machine Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1980, Ser. No. 169,216
Claims priority, application Japan, Mar. 6, 1980, 55-27284
Int. Cl.³ F16C *29/02, 32/06*
U.S. Cl. 308—3 A **12 Claims**



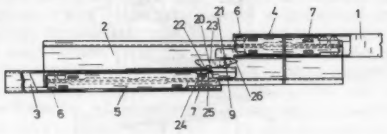
1. A load-compensated type guide mechanism of a machine, comprising:
- a stationary base incorporated in said machine;
- a guide surface formed in said stationary base;
- a movable machine part having a slide surface contacting said guide surface of said stationary base;
- a fluid supply source for generating a pressurized fluid to be supplied between said guide surface and said slide surface;
- fluid conduit means disposed between said fluid supply source and said machine for introducing said pressurized fluid from said fluid supply source between said guide surface and said slide surface thereby to produce a pressure force for lifting said movable machine part above said guide surface of said stationary base;
- a pressure regulating means for establishing a preadjusted pressure level of said pressurized fluid such that said pressure force for lifting said movable machine part is smaller than a premeasured perpendicular load acting from said slide surface of said movable machine part toward said guide surface of said stationary base;
- means for detecting a change in the amount of perpendicular elastic deformation of projections formed in at least one of said slide surface and said guide surface when said perpendicular load acting from said slide surface toward said guide surface changes; and
- pressure control means for automatically controlling said preadjusted pressure level of said pressurized fluid in response to the change in said perpendicular elastic deformation so that a frictional force acting between said slide surface of said movable machine part and said guide surface of said stationary base is maintained at a constant level regardless of change in said perpendicular load.

4,351,575
PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m. b. H., Höchst, Austria

Filed Jul. 15, 1980, Ser. No. 169,195
Claims priority, application Austria, Jul. 19, 1979, 4980/79; May 6, 1980, 2416/80
Int. Cl.³ F16C *29/04*
U.S. Cl. 308—3.8 **7 Claims**

1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein the drawer is slidably insertable into and removable from a furniture body, said assembly comprising:
- a supporting rail adapted to be connected to a side wall of a furniture body;
- a first carriage mounted to run along said supporting rail, said first carriage having bearing supports;
- a pull-out rail adapted to be connected to a side of a drawer;
- a second carriage mounted to run along said pull-out rail, said second carriage having bearing supports;
- a center rail having vertically spaced horizontal flanges extending between and supported by said bearing supports of said first and second carriages, such that said carriages are movable along said center rail and said center rail is movable with respect to said pull-out and supporting rails; and

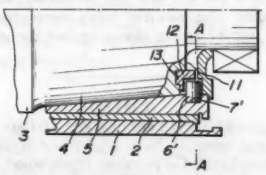


- catch means for fixing the relative longitudinal positions of said center rail and said carriages when said pull-out rail is moved with respect to said supporting rail to a drawer fully pulled-out position, said catch means comprising a two-arm lever pivotally connected to said center rail, said lever including a first arm pivotable toward and engageable with one of said carriages in said drawer fully pulled-out position, and said lever including a second arm pivotable toward and engageable with the other of said carriages or the said rail thereof in said fully pulled-out position.

4,351,576
OIL FILM BEARING FOR ROLLING ROLL

Teruyuki Nishide; Takayuki Naoi; Makoto Shitomi; Keiichi Hamada, and Hidetami Noguchi, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Feb. 24, 1981, Ser. No. 237,625
Claims priority, application Japan, Jul. 8, 1980, 55-92201
Int. Cl.³ F16C *17/02;* B21B *31/07*
U.S. Cl. 308—37 **3 Claims**



1. In an oil film bearing for rolling roll consisting of a bushing in a roll chock bearing box and a sleeve tightly engaged with a rolling roll tapered neck to form a journal to the bushing, the improvement comprising that said sleeve is provided with a portion which projects from a smaller diameter end of the rolling roll tapered neck, a keyway is provided in an inner circumference of the projected portion of the sleeve and a holder, by which a radially inner end of the key inserted in the keyway is anchored, is provided at the smaller diameter end surface of the tapered neck.

4,351,577
WIRE RING BEARING

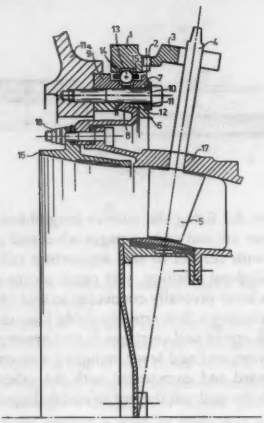
Anton Zacherl, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 193,183

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940206

Int. Cl.³ F16C *27/04, 33/61*

U.S. Cl. 308—189 R **5 Claims**



1. A wire ring bearing comprising two bearing rings concentrically arranged for relative motion with respect to one another, a plurality of rolling elements disposed between said rings, said rings being provided with opposed circumferentially extending slots, wire rings in said slots rollably supporting said rolling elements, one of the two bearing rings comprising a plurality of individual ring elements which jointly define the slot extending in said one bearing ring, fastener means holding said ring elements together in assembled relation, and means resiliently engaging said individual ring elements in the assembled relation, said means resiliently engaging said individual ring elements in the assembled relation comprising a spring arranged between the fastener means and one of said individual ring elements, said fastener means comprising a screw, a sleeve in a hole provided in said one individual ring element, said screw bearing against said sleeve to urge the same and said one individual ring element against an adjacent second individual ring element, said spring being arranged between said sleeve and said one individual ring element, said one individual ring element being supported for endwise movement relative to the sleeve against the pressure of said spring.

4,351,578
AUTOMATED LAMP AGING

John Fajt, and James V. Neal, Jr., both of Wynnewood, Okla., assignors to Xenell Corporation, Wynnewood, Okla.

Filed Sep. 12, 1980, Ser. No. 186,615

Int. Cl.³ H01J *9/00*

U.S. Cl. 316—1 **52 Claims**

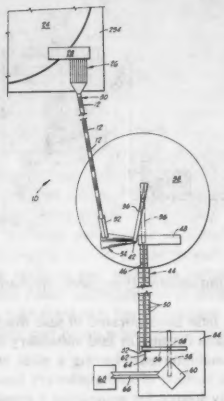
1. An automated method of aging negative glow lamps, comprising:

(a) mechanically orienting a plurality of lamps with a lamp orienting means, each of said lamps including a bulb with first and second lamp lead wires extending therefrom, so that said lamps may be received by a lamp holder;

(b) feeding said oriented lamps to a first predetermined position;

(c) receiving each of said lamps one at a time in said lamp holder when said lamps are in said first predetermined position;

(d) transferring, by movement of said lamp holder, each of said lamps from said first predetermined position to a second predetermined position where said first and second lead wires of each lamp are received in a pair of lead wire receptacles of a lamp aging conveyor, said conveyor including a plurality of pairs of lead wire receptacles so that a plurality of lamps may be conveyed simultaneously;



(e) driving said lamp aging conveyor, thus conveying each of said lamps away from said second predetermined position; and

(f) while each of said lamps is on said lamp aging conveyor, directing an electric current to said pair of lead wire receptacles and thus to said first and second lead wires to age said lamps on said lamp aging conveyor.

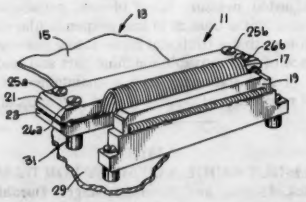
4,351,579
CLAMP FOR ELECTRICAL CABLE AND CABLE TERMINATING SYSTEM

Arthur W. Kordes, Los Altos; Robert M. Andrade, San Jose, and Roger W. Peterson, Los Altos, all of Calif., assignors to The Initiators, Los Altos, Calif.

Filed Nov. 3, 1980, Ser. No. 203,131

Int. Cl.³ H01R *4/66, 13/58*

U.S. Cl. 339—14 R **8 Claims**



1. A clamp for sheathed or jacketed flat electrical cable comprising,

first and second facing jaws formed for mutual contact, said jaws having a length, width and depth, with the width of said jaws exceeding the width of a flat electrical cable to be clamped, said jaws defining a lengthwise tunnel accommodating a flat electrical cable therethrough, fastener means for urging said jaws together in the depthwise direction, constricting said tunnel to dimensions providing snug non-crimping contact with the cable said jaws having a toothed section in said tunnel with teeth extending

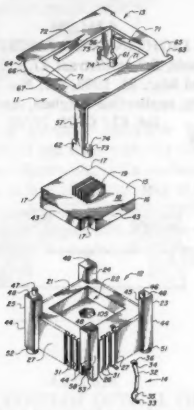
inwardly toward the central tunnel region from a first section recessed further outwardly relative to a second recessed section, said first section accommodating sheathed or jacketed cable, while said second section accommodates unsheathed or unjacketed portions of the same cable.

4,351,580

CARRIER SOCKET FOR LEADLESS INTEGRATED CIRCUIT DEVICES

Michael Kirkman, Swansea; Frank C. Rydwansky, Jr., Quincy; Richard J. Hanlon, Attleboro, and Richard W. Petersen, Taunton, all of Mass., assignors to Augat Inc., Attleboro, Mass.

Filed May 15, 1980, Ser. No. 150,047
Int. Cl.[3] H01R *23/72*
U.S. Cl. 339—17 CF **18 Claims**



1. A carrier socket for a leadless chip integrated circuit having a predetermined exterior dimension, said socket comprising:

a generally rectangular base formed with upright corner posts having flat right angled outer walls which have flat surfaces, the flat surfaces on opposed posts defining a plane, said base having side walls extending between said posts, said side walls having outer surfaces, there being a plurality of longitudinal slots in said outer surfaces, said slots being opened outwardly and exposed at the outer surfaces of said walls, said base having an outer dimension defined by the planes which include the flat surfaces of said corner posts, said outer dimension substantially matching the exterior dimension of said integrated circuit, thereby to enable the edges of said circuit to extend out to the exterior dimension of said base;

a plurality of contact members, one said contact member residing in each of at least some of said slots; and

a cover member extending between said corner posts and being substantially coextensive with said base member, said cover member removably engaging said base member.

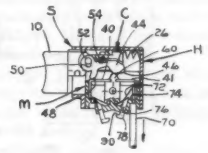
4,351,581

TRIGGER OPERATED TOOL HANDLE SWITCH

Julius P. Wied, Hudson, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Division of Ser. No. 963,778, Nov. 27, 1978, Pat. No. 4,256,942. This application Feb. 12, 1981, Ser. No. 233,930
Int. Cl.[3] H01R *4/24*
U.S. Cl. 339—95 D **1 Claim**

1. In an electrical switch mechanism for a portable electric motor driven type tool including a trigger-switch assembly having a switch housing and a switch module portion disposed within the switch housing said module portion comprising; a module casing, a plurality of spaced stationary electrical contacts disposed in said casing, a spring-like elongated retainer blade coacting with each contact and diagonally disposed with respect to the contact with the free end of the blade adapted when in active condition to releasably engage an associated insertable bared conductor wire for gripping the latter to hold it in place against the contact, said module casing having a wire passageway disposed below and leading to a point near the free end of the retainer blade and adjacent the contact for receiving the bared conductor wire, said module casing also having a release arm passageway adjacent the wire passageway, a wire release arm disposed in said release arm passageway for selectively deactivating said retainer blade to permit ready withdrawal of the wire from coaction with the respective stationary contact, said release arm being slidable in said release arm passageway so as to be engageable with the retainer blade for moving the latter out of gripping coaction with the wire to permit withdrawal of the wire from the module, the lower portion of said release arm being disposed exteriorly of said module casing, retaining means for retaining the



release arm within the module casing including locking means on the release arm for coaction with respective restraining means in the module casing for retaining the release arm in assembled relation within the module casing, said release arm having a laterally extending handle lug on its exteriorly exposed free end for engagement with the exterior surface of the module casing to limit inward movement of said release arm with respect to said module casing and also forming a handle enabling facile manual operation of the release arm, the inner end of the release arm which contacts the retainer blade being beveled to effect a coacting plane-to-plane contact with the retainer blade to provide a more positive and firm contact therewith, said passageways being formed in part by the switch housing, each contact having a coacting retainer blade with a coacting release arm, said structure further including adjacent release arms being connected together to form a "U"-shaped tandem release member, the restraining means in the module casing including said module casing having a coacting shoulder extending toward the release arm, and said locking means includes said release arm having a coacting arm abutment engaging said shoulder to reciprocably retain said release arm in said release arm passageway.

4,351,582

ADAPTING ELECTRICAL CONNECTOR

James A. Emerson, Pekin; James M. Ramsey, Floyd Knobs, and Kerry O. Buck, New Albany, all of Ind., assignors to Robinson Nugent, Inc., New Albany, Ind.

Filed May 23, 1980, Ser. No. 152,670
Int. Cl.[3] H01R *4/24*
U.S. Cl. 339—97 R **3 Claims**

1. An electrical contact comprising:

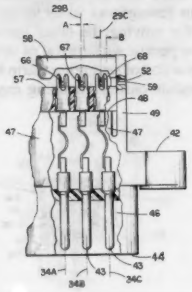
an elongate member of electrically conductive material having a first end portion for engaging a first electrical conductor, a second end portion for engaging a second electrical conductor, and an intermediate portion joined to said end portions,

said intermediate portion shaped to elastically sustain the weight of each of said end portions when the member is

gripped at the other of said end portions, regardless of orientation of said other end portion, but accommodate intentional variation of the distance between said end portions,

said first end portion including an insulation piercing and displacing yoke formed to define a wire receiver slot oriented to receive a wire with its axis perpendicular to said first plane,

part of said intermediate portion having a substantial cross sectional thickness, measured in a first direction perpendicular to said plane, and said part of said intermediate portion having a lesser cross sectional thickness, measured perpendicular to said direction, to accommodate resilient bending of said intermediate portion in a plane parallel to said first plane for changing the distance between the junctions of said intermediate portion to said end portions;



said yoke being formed by a pair of substantially flat and coplanar prongs lying in said first plane, and a bight from which said prongs project;

and an offset arm extending from said bight perpendicular to said first plane;

a leg extending from said arm in a direction opposite the direction of projection of said prongs, and in a second plane parallel to said first plane, said leg having a portion remote from said arm rearwardly turned and commencing said part of said intermediate portion, said leg having a reduced cross section thickness measured in a direction perpendicular to said planes at a line between said rearwardly turned portion and said arm,

said part of said intermediate portion turning parallel to said second plane at a point remote from said line and extending to said second end portion.

4,351,583

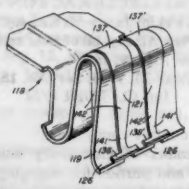
ELECTRICAL TERMINAL

Harold E. Belttary, Rio Piedras, P.R., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 19, 1980, Ser. No. 160,897

Int. Cl.³ H01R *4/48*

U.S. Cl. 339—259 R **18 Claims**



1. An electrical terminal comprising

an electrical contact including a strip of metal of flexible material having good electrical conductivity, a low coefficient of friction, and the oxide of which is unstable and can break down to produce a relatively good conductor, having at least a portion formed as a generally U-shaped member having a bight portion and having arms more closely spaced at its free ends than in the region of said bight portion, said arms being flared outwardly at said free ends; said U-shaped member being formed with a plurality of recesses which extend from said free ends through said bight portion; and

a resilient, generally U-shaped reinforcing member arranged substantially without said U-shaped member contact and embracing said arms, and being formed of material which retains its resiliency when subjected to heat; said resilient member being formed of a plurality of recess engaging portions connected at ends thereof, said connected portions being adapted to nest, at least partially, within said recesses.

4,351,584

RING LIGHTING FOR MICROSCOPES

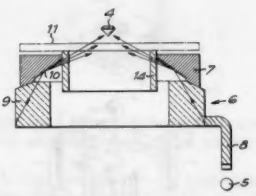
Jean L. Chandesais, Schawijkstraat 27, 2228 Ranst, Belgium

Filed Mar. 31, 1980, Ser. No. 135,770

Claims priority, application Belgium, Apr. 11, 1979, 57718

Int. Cl.³ G02B *21/10*

U.S. Cl. 350—89 **2 Claims**



1. An illumination device for use in a microscope to illuminate, in a ring-shaped manner, a precious stone to be examined by said microscope along a viewing axis, said device including:

a source of light mounted at a distance from said precious stone;

a ring-shaped piece mounted around said viewing axis;

a light conducting fiber arranged between said source of light and said annular light transmitter, said transmitter, when receiving light from said light source through said light conducting fibers spreading said light over an annular surface;

an annular reflector mounted adjacent said ring-shaped piece and having a rough inner surface which is inclined with respect to said axis and which is adapted to reflect the light from said annular surface toward said viewing axis in a diffused way;

a ground glass applied within said annular reflector, between said reflector and said precious stone, whereby substantially all of the light reflected by the annular reflector strikes the ground glass.

4,351,585

COUPLING ELEMENT FOR AN OPTICAL WAVEGUIDE

Gerhard Winzer, and Franz Auracher, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 91,898

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851646

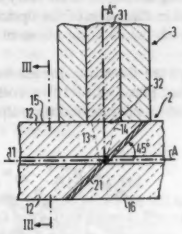
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.15 **3 Claims**

1. In a coupling element for use in coupling a light signal into

or out of an optical waveguide, said element comprising at least one waveguide being mounted in a support member, the improvement comprising the support member together with the waveguide mounted therein being formed by a single glass core optical fiber having a glass cladding with a diameter of at least 1 mm so that the cladding is very thick relative to the diameter of the core, said single glass core optical fiber with a glass cladding being a monomode glass fiber divided into two



separate parts by a partially reflective layer extending obliquely to the core of the fiber with the core end surfaces being in flush contact therewith, and a multimode waveguide being mounted on a surface of the cladding of the optical fiber with an end surface positioned to receive light reflected from one of the parts of the monomode fiber by the reflective layer, so that the reflected light is coupled into the multimode waveguide.

4,351,586

TERMINATION OF OPTICAL FIBERS

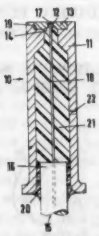
Michael J. Phillips, Stanstead, and Aubrey M. Crick, Epping, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,759

Claims priority, application United Kingdom, May 6, 1975, 18930/75

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **8 Claims**



1. A sheathed optical fiber termination comprising:

a hollow cylindrical ferrule;

an optical fiber mounted lengthwise in said ferrule and having its sheathing terminating within said ferrule leaving a forward unsheathed end portion of said fiber in said ferrule;

a pierced watch bearing jewel fixedly mounted at the forward end of said ferrule having an aperture therein coaxial with the center axis of said ferrule; and

said unsheathed end portion of said fiber being threaded into said aperture.

4,351,587

APPARATUS FOR POSITIONING EYEPIECE OF ENDOSCOPE

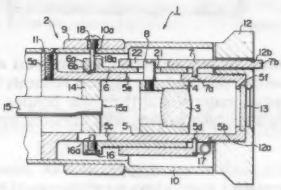
Kazumasa Matsuo, Tama, and Tetsumaru Kubota, Hachioji, both of Japan, assignors to Olympus Optical Company, Ltd., Japan

Filed Feb. 25, 1980, Ser. No. 124,457

Claims priority, application Japan, May 3, 1979, 54/25786; May 3, 1979, 54/25787; May 3, 1979, 54/25788

Int. Cl.³ G02B *7/04*

U.S. Cl. 350—255 **20 Claims**



1. An eyepiece assembly for an endoscope, comprising:

(A) a lens sleeve supporting a lens of said eyepiece assembly and being slidably mounted for translational movement along an optical axis of said lens;

(B) a photographic positioning cam sleeve mounted for rotational movement about said axis, said photographic positioning cam sleeve having a photographic positioning cam slot formed therein;

(C) a dioptry adjusting cam sleeve mounted for translational movement along said axis, said dioptry adjusting cam sleeve having a dioptry adjusting cam slot formed therein; and

(D) a dioptry adjusting pin connected to said lens sleeve and extending through both of said cam slots, said pin cooperating with said cam slots in such a manner that:

(1) said cam slot in said photographic positioning cam sleeve positions said pin, and therefore said lens, at a predetermined axially position, corresponding to a photographing position, when said photographic positioning cam sleeve is in a first angular position; and

(2) said cam slot in said dioptry adjusting cam sleeve positions said pin, and therefore said lens, at an axial position determined by the axial position of said dioptry adjusting cam sleeve when said photographic positioning cam sleeve is in a second angular position, different from said first angular position.

4,351,588

PROCESS AND MEANS FOR CONTROLLING THE RADIANT ENERGIES OF THE ENTIRE SPECTRAL RANGE IN ROOMS

Harry T. Züllig, Montagnola, Switzerland, assignor to Relium AG, Rupperswil, Switzerland

Filed May 21, 1980, Ser. No. 152,081

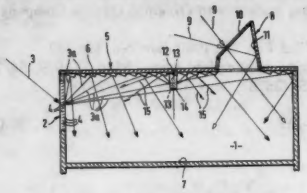
Claims priority, application Switzerland, Apr. 24, 1979, 3815/79; Jun. 21, 1979, 5180/79

Int. Cl.³ G02B *17/00, 27/00*

U.S. Cl. 350—259 **15 Claims**

1. An energy-spreading installation for controlling, in the entire spectral range, radiant energy amounts irradiating a room having a plurality of confining walls comprising a bottom floor, a side wall zone and a ceiling zone, which room the energy amounts are to fill, said radiant energies stemming from at least one radiation source located outside or inside said room, comprising surface means adapted for a predetermined spreading, in said room, of radiant energy in order to attain a state ranging from diffusion to total reflection, in the entire spectral range, said means being mountable on a confining wall of the room; wherein said surface means comprise those of a double-glazed window, said window comprising a plurality of

reflection elements arranged one above the other and located between the two glass panes of the window; and wherein said reflection elements comprise shell-shaped reflectors and support elements for said reflection, said support elements being specular on one side; and said support elements being of transparent plastics material and their side holding the reflectors comprising a specular surface with diffusing structures.



4,351,589

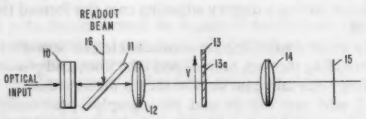
METHOD AND APPARATUS FOR OPTICAL COMPUTING AND LOGIC PROCESSING BY MAPPING OF INPUT OPTICAL INTENSITY INTO POSITION OF AN OPTICAL IMAGE

Pierre H. Chavel; Alexander A. Sawchuk, both of Los Angeles; Bernard H. Soffer, Pacific Palisades; Timothy C. Strand, and Armand R. Tanguay, Jr., both of Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 8, 1980, Ser. No. 138,672

Int. Cl.³ G02F *1/29, 1/00;* G06F *7/56*

U.S. Cl. 350—342 **14 Claims**



1. An optical logic processor employing input optical intensity to output optical spatial position mapping, comprising:

an electro-optical device for receiving discrete input optical object beams each of a first or a second intensity level and for receiving a separate readout optical beam;

means forming a part of said electro-optical device for producing diffracted optical outputs of portions of said readout optical beam, which optical outputs are diffracted to unique spatial positions, each as a direct function of the intensity of one of said input optical object beams or of combinations of the intensities of said input optical object beams; and

means including a spatial filter having discrete apertures therein, at said unique spatial positions for transmitting selected portions of said diffracted optical outputs for implementing discrete optical logic functions.

4,351,590

MOTION PICTURE CAMERA WITH AUTOMATIC FOCUSING DEVICE

Noritsugu Hirata, Yokohama; Masamichi Toyama, Machida; Hideto Iwama, Kawasaki; Hidekazu Okajima, Naka, and Akimasa Nishimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,441

Claims priority, application Japan, Oct. 16, 1979, 54-133409; Dec. 11, 1979, 54-161017

Int. Cl.³ G03B *3/00*

U.S. Cl. 352—140 **6 Claims**

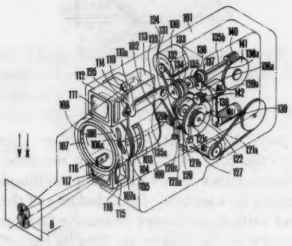
1. A motion picture camera with an automatic focusing device, comprising:

(a) a signal source capable of projecting an energy flux toward an object to be photographed, the direction in which said energy flux is projected being arranged to be continuously variable;

(b) a first rotatable cam member arranged to continuously vary the projecting direction of said signal source in accordance with the rotating phase of said first rotatable cam member;

(c) a second rotatable cam member and a motor for rotatably driving said second cam member, said second rotatable cam member being arranged to directly displace a photograph taking lens in direction of the optical axis of the lens in accordance with the rotating phase of said second cam member;

(d) first rotating phase detecting means being arranged to detect the rotating phase of said first rotatable cam member and to provide a corresponding output;



(e) second rotating phase detecting means being arranged to detect the rotating phase of said second rotatable cam member and to provide a corresponding output;

(f) signal receiving means for receiving the signal projected from said signal source and for providing a corresponding output; and

(g) control circuit means which compares the output of said first rotating phase detecting means with the output of said second rotating phase detecting means when a predetermined output of said signal receiving means is provided, said control circuit means being arranged to control said motor to cause said two outputs of said first and second rotating phase detecting means to satisfy a predetermined relation to each other.

4,351,591

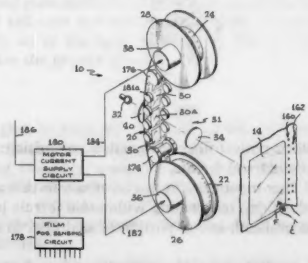
MERCHANDISING TERMINAL

Larry A. Stockett, Washington, D.C., assignor to Logicon, Inc., Torrance, Calif.

Filed Dec. 3, 1979, Ser. No. 99,630

Int. Cl.³ G03B *23/12*

U.S. Cl. 353—25 **5 Claims**



1. A merchandising terminal for aiding in the selection of products appropriate to the conditions of a customer comprising:

a console having a screen;

means for displaying a succession of images on said console screen, with each of a plurality of said images including a plurality of image areas defining different conditions which may relate to a customer, a plurality of said image areas each including a different picture which illustrates the condition;

switch means each associated with a particular one of said image areas and operable by a person viewing the images for selecting an appropriate condition in each of said images which display a plurality of conditions; and

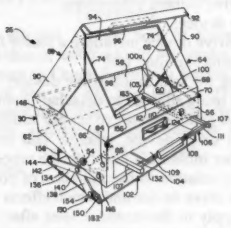
logic means responsive to the selections made by persons on said switch means, for generating outputs indicating products particularly appropriate to the needs of the person, with at least one of said outputs determined by a plurality of said condition selections that are made when different images were displayed.

4,351,592

COLLAPSIBLE MICROFICHE READER ASSEMBLY ESPECIALLY SUITABLE FOR USE IN A DESK DRAWER

William T. Link, Berkeley; Steven R. Runyan, Los Atlos Hills, and Stephen Hobson, Santa Clara, all of Calif., assignors to Datagraphix, Inc., San Diego, Calif.

Filed Mar. 4, 1980, Ser. No. 127,239
Int. Cl.³ G03B *21/30*
U.S. Cl. 353—72 **22 Claims**



1. A microfiche reader assembly especially suitable for use in a desk drawer having a horizontal base, opposite upstanding side panels and upstanding front and back panels, said assembly comprising:

(a) a microfiche support arrangement including means for supporting a microfiche, said microfiche supporting means being movable within the confines of a given rectangular operating area;

(b) a projection screen;

(c) an optical arrangement cooperating with a supported microfiche for projecting an enlarged image of a section of said microfiche onto said screen when the supported microfiche is in said operating area;

(d) housing means for supporting said microfiche support arrangement, projection screen and optical arrangement relative to one another;

(e) housing support means adapted for positioning entirely within said drawer on the base of the latter and supporting said housing means for movement between

(i) a first retracted position entirely within the confines of said drawer a fixed distance above the base of the latter such that said microfiche support arrangement, projection screen and optical arrangement are positionable entirely within confines of said drawer, whereby to close the latter, and

(ii) a second extended position above said retracted position such that, when said drawer is open, the operating area of planar movement of said microfiche supporting means extends over an adjacent one of said drawer panels and beyond said adjacent one of said drawer panels and beyond said adjacent panel outside said drawer whereby the supported microfiche is movable outside said drawer while remaining in its operating area; and

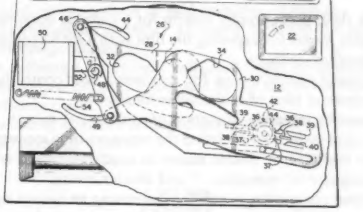
(f) a cover lid pivotally connected with said housing means on one side thereof for movement between a substantially horizontally extending closed position and an upwardly pivoted opened position, said cover lid being interconnected with said housing support means so as to cause the latter to move said housing means from its retracted position to its extended position when said lid is moved from its closed position to its opened position and to cause said housing support means to move said housing means from its extended position to its retracted position when said lid is moved from its opened position to its closed position.

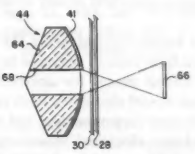
4,351,593

METHOD AND APPARATUS FOR SELECTIVE POSITIONING OF SPECTRAL FILTER DURING EXPOSURE CONTROL

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1979, Ser. No. 108,219
Int. Cl.³ G03B *7/087*
U.S. Cl. 354—27 **20 Claims**





1. In a photographic apparatus having means for directing image forming light rays from a scene along a given path to a photographic film material mounted at a given focal plane, means for evaluating radiation from said scene during an evaluation period, means for unblocking and blocking said path to provide an exposure interval during each part of which essentially the same given range of spectral frequencies are continuously transmitted from the scene to the focal plane, and means responsive to said evaluation means for controlling said unblocking means to define an exposure interval, the improvement wherein said evaluating means includes:

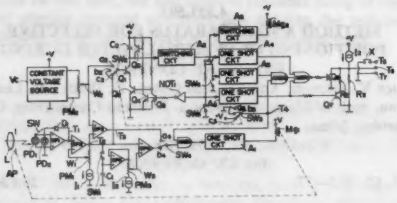
means for substantially precluding evaluation of selected spectral frequencies during one portion of the evaluation period while substantially permitting evaluation of said selected frequencies during at least another portion of said period.

4,351,594

ELECTRONIC EXPOSURE AND FLASH CONTROL SYSTEMS FOR SLIT-SHUTTER TYPE CAMERAS

Tokuji Ishida, Daito, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1981, Ser. No. 231,670
Claims priority, application Japan, Feb. 6, 1980, 55-14044
Int. Cl.[3] G03B *15/03*
U.S. Cl. 354—139 11 Claims



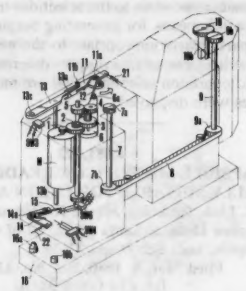
1. A flash photography system for a camera, comprising:
shutter means for exposing the film with a slit sweeping over the film surface;
electrical circuit means for measuring and controlling the exposure time of said shutter means;
means for initiating operation of said shutter means;
a trigger switch for initiating the exposure time measurement of said electric circuit means in synchronization with the initiation of operation of said shutter means;
a signal generation circuit for generating an output signal in response to the operation of said triger switch;
an electronic flash tube for emitting flash light for illuminating a scene to be photographed;
means for supplying electrical power to said electronic flash tube;
a trigger circuit means for triggering the light emission of said electronic flash tube in response to said signal;
a light control circuit means for controlling the electrical power supplied to said electronic flash tube, and including a switching element for connecting and disconnecting said flash tube and said electrical power supplying means to each other, detection means for detecting the light emitted from said flash tube and light control means for controlling said switching element in accordance with the output of said detection means for a time period during which the exposure slit keeps travelling;
said light control means for controlling said switching element includes first level setting means for generating a first level signal, second level setting means for generating a second level signal, comparison means for controlling said switching element in accordance with the comparison of the output of said detection means with said first or second level signal, and first selection means for selectively connecting said first and second level signal with said comparison means, said first level signal providing a higher flash light intensity than said second level signal, and;
said light control means controlling the flash light intensity to be constant with selection of each said first and second level signals.

4,351,595

MOTOR DRIVE CAMERA

Nobuaki Date, Kawasaki; Nobuaki Sakurada, Yokohama, and Masami Shimizu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,225
Claims priority, application Japan, Jul. 3, 1980, 55-91102; Jul. 3, 1980, 55-91103
Int. Cl.[3] G03B *1/18*
U.S. Cl. 354—173 9 Claims



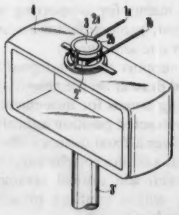
1. A motor drive camera comprising:
a motor drive device;
said motor drive device including a motor for winding up or rewinding the film; and
a power source for said motor drive device;
said camera being adapted to detachably connect an auxiliary power source device to supply additional power to the motor drive device, wherein said motor drive device further includes a timer device whose operation is initiated in relation to the initiation of power supply to the motor drive device and which effects the stop of the power supply to the motor at least after the passage of the time necessary to wind the film by one frame.

4,351,596

ELECTROMAGNETIC DRIVING SOURCE FOR SHUTTER

Takehiko Ohniwa, Chichibu, and Syuichiro Saito, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Dec. 15, 1980, Ser. No. 216,431
Claims priority, application Japan, Dec. 19, 1979, 54-175841[U]
Int. Cl.[3] G03B *9/00*
U.S. Cl. 354—234 1 Claim



1. A current supply device for a moving coil of an electromagnetically driven shutter mechanism for a camera, said moving coil operating in cooperative relationship with a magnetic field generated by the permanent magnet of a stator of said shutter mechanism to be rotatively driven upon being supplied with exciting current from a power source through

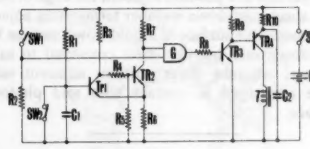
said current supply device in order to drive a shutter blade assembly of said shutter mechanism, said moving coil having a first shaft fixed to one side thereof for transmitting rotation of said coil to said shutter blade assembly, said current supply device comprising: a second shaft fixed to a side of said coil opposite said one side; a pair of slide pieces each affixed to the outer circumference of said second shaft and having insulating material inserted therebetween each connected to the end of said coil; said slide pieces being formed in a semicylindrical configuration and made of highly conductive material having on the outer circumference thereof a groove defining two opposed inclined surfaces; two current supply brushes resiliently contacting each of said slide pieces, respectively, to supply current from a power source to said moving coil in order to rotatively drive said moving coil; said brushes having an arcuate configuration operating to maintain each of said current supply brushes in direct contact with each of said two inclined surfaces of said groove.

4,351,597

CAMERA HAVING ELECTROMAGNETIC RELEASE CONTROL

Nobuaki Date; Hiroshi Aizawa, both of Kawasaki; Masanori Uchidoi, Yokohama, and Yoshiaki Watanabe, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 811,303, Jun. 29, 1977, abandoned.
This application Jan. 17, 1979, Ser. No. 4,269
Claims priority, application Japan, Jun. 30, 1976, 51-77189
Int. Cl.³ G03B *17/40*
U.S. Cl. 354—266 **7 Claims**



1. An electromagnetic release device for a camera, comprising:

release operation signal generating means for generating a signal in response to a release operation;

wind-up completion signal generating means for generating a signal in response to completion of a wind-up operation;

discriminating means for receiving the signal from the release operation signal generating means and the signal from the wind-up completion signal generating means, for determining which of the two signals is received later, and for generating a release signal in response to the signal which is received later;

said discriminating means having delay means so as to generate the release signal after a lapse of time set by the delay means when the signal received later is the signal from the wind-up completion signal generating means, and immediately to generate the release signal when the signal received later is the signal from the release operation signal generating means;

electromagnetic release means for actuating internal mechanisms in the camera, and

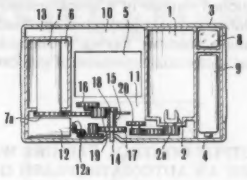
control means for actuating the electromagnetic release means in response to the release.

4,351,598

CAMERA

Toyotosi Suzuki; Hideo Tamamura, both of Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 253,063
Claims priority, application Japan, Apr. 14, 1980, 55-50243[U]
Int. Cl.³ G03B *17/02*
U.S. Cl. 354—288 **4 Claims**



1. A camera adapted to have loaded therein film in a cartridge and having incorporated therein an electric motorized drive mechanism for automatically winding and rewinding said film, comprising:

an opening window for effecting film exposure formed in a generally central portion of the camera to define at least a pair of shorter sides;

a cartridge chamber arranged along one of the shorter sides of said opening window;

a fork for rewinding the film on said cartridge, said fork being provided on the bottom of said cartridge chamber;

a battery-containing chamber arranged adjacent the side of said cartridge chamber;

a finder defining a single light path, said finder being arranged beside said cartridge chamber and above said batter-containing chamber; and

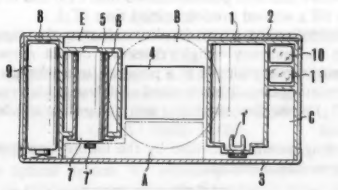
a film winding chamber arranged along the other shorter side of said opening window.

4,351,599

CAMERA

Toyotosi Suzuki, Tokyo; Mutsuhide Matsuda, Yokohama, and Hideo Tamamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,409
Claims priority, application Japan, Apr. 17, 1980, 55-51881
Int. Cl.³ G03B *17/02*
U.S. Cl. 354—288 **4 Claims**



1. A camera capable of utilizing film in a cartridge and having incorporated therein an electric motorized drive mechanism for automatically winding and rewinding said film comprising:

a camera body having an upper cover portion and a bottom cover portion;

an opening window for effecting film exposure formed in a generally central portion of said camera body;

a cartridge camera arranged along one of the shorter sides of said opening window;

a film winding chamber arranged along the other shorter side of said opening window and a drive source contained in a takeup spool in said film winding chamber;

a finder arranged in said camera body, said finder being surrounded by said upper cover portion and said bottom cover portion and being positioned outside of a space defined by said cartridge chamber and said film winding chamber; and

a battery-containing chamber arranged in said camera, said battery-containing chamber being surrounded by said upper cover portion and said bottom cover portion and being positioned outside of a space defined by said cartridge chamber and said film winding chamber, said battery-containing chamber having a dimension in height almost equal to the axial dimension of said cartridge chamber.

4,351,600

FLASH OUTPUT CONTROL FAILURE WARNING DEVICE OF AN AUTOMATIC FLASH OUTPUT CONTROL SPEED LIGHT

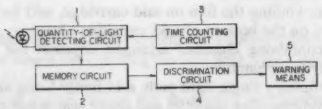
Hiroshi Hasegawa, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Japan

Continuation of Ser. No. 226,013, Jan. 19, 1981, abandoned. This application Sep. 14, 1981, Ser. No. 302,072

Claims priority, application Japan, Jan. 13, 1980, 55/10702

Int. Cl.[3] G03B *17/18*

U.S. Cl. 354—60 L **16 Claims**



1. A flash output control photography failure warning device in a camera characterized by:

a quantity-of-light detecting circuit adapted to start operating in synchronism with shutter release and to change from a first condition to a second condition when the integrated amount of the light from an object reaches a first predetermined value;

a time counting circuit for counting a predetermined time (T_2) greater than the longest light emission time of a flashlight discharge tube in synchronism with shutter release;

a memory circuit adapted to start memorizing the condition of said quantity-of-light detecting circuit after the longest light emission time of the flashlight discharge tube and before said first predetermined time (T_2) and to memorize it till a second predetermined time (T_3);

a discrimination circuit for discriminating that the condition of the quantity-of-light detecting circuit memorized by said memory circuit at a point of time whereat said time counting circuit has couned said first predetermined time (T_2) is the first condition and generating a failure signal; and

warning means controlled by the failure signal of said discrimination circuit.

4,351,601

SHEET STRIPPING HOLD DOWN ASSEMBLY

Raymond G. Cormier, Nashua, and John D. Gibbs, Amherst, both of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed Jun. 24, 1980, Ser. No. 162,500

Int. Cl.[3] G03G *15/00*

U.S. Cl. 355—3 SH **5 Claims**

1. In a copying apparatus having:

a moving reusable photosensitive surface,

means for scanning an original to produce a latent electrostatic image on said surface,

means for developing said latent image, and

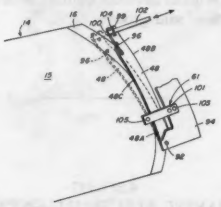
a transfer station for transferring said developed image onto a transfer material, said transfer station having:

means for conveying a sheet of transfer material into contact with said photosensitive surface at said transfer station for transferring said developed image from said surface to said sheet, portions of said sheet successively contacting said surface,

means for stripping said sheet from said surface, and

means for transporting said stripped sheet from said transfer station,

said sheet stripping means including a guide member having a sheet pick-off blade which, during sheet stripping, overlays a marginal portion of said surface at said transfer station for engaging at least a corner of a leading edge of



said sheet conveyed to said transfer station and guiding said leading edge to said transport means,

a sheet hold down assembly comprising

a support member extending substantially normally to the direction of movement of said photosensitive surface, and

a sheet hold-down member, supported by said support member, comprising a longitudinal member extending from said support member normally to said photosensitive surface at a position adjacent the edge of said blade, said sheet hold-down member terminating adjacent said photosensitive surface in a hold-down surface for holding down said transfer sheet conveyed to said drum surface, whereby sheet portions adjacent said blade edge are urged in contact with said photosensitive surface.

4,351,602

ELECTROSTATIC PRINTER

Yoshihiro Yamada, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 23, 1980, Ser. No. 171,478

Claims priority, application Japan, Jul. 27, 1979, 54-103693[U]

The portion of the term of this patent subsequent to Jul. 1, 1998, has been disclaimed.

Int. Cl.[3] G03G *15/00, 21/00;* G03B *27/00*

U.S. Cl. 355—3 R **3 Claims**

1. An electrostatic printer comprising:

a movable photosensitive member;

exposure means including a cathode ray tube for transmitting an optical image to said photosensitive member to form an electrostatic latent image on said photosensitive member and an optical plate connected to said cathode ray tube between said cathode ray tube and said photosensitive member, said optical plate being positioned a predetermined distance from said photosensitive member to form a gap;

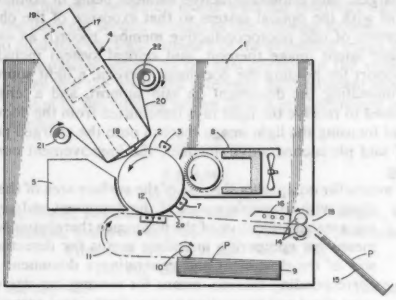
developing means for developing said electrostatic image by applying toner to said photosensitive member;

transfer means for transferring the developed electrostatic image to paper;

a transparent film provided between said photosensitive

member and said optical plate such that it covers and contacts said optical plate; and

moving means for moving said transparent film to cover said



optical plate with a clean toner free film portion, said moving means initially being actuated when power is supplied to said electrostatic printer before the formation of an electrostatic image on said photosensitive member.

4,351,603

ELECTRONIC COPYING APPARATUS

Kazuaki Tagawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

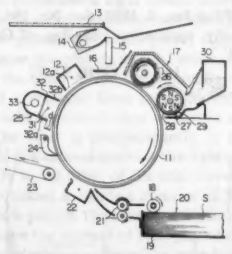
PCT No. PCT/JP79/00221, § 371 Date Apr. 23, 1980, § 102(e) Date Apr. 23, 1980, PCT Pub. No. WO80/00502, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 21, 1979, Ser. No. 204,364

Claims priority, application Japan, Aug. 28, 1978, 53-104728; Aug. 29, 1978, 53-105373

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 CH **5 Claims**



1. In an apparatus comprising a record medium movable relative to a plurality of processing stations for forming images on a transfer medium, said stations including means for forming an electrostatic latent image on said record medium, a developing unit for developing the electrostatic latent image with a toner powder, a transfer unit including a corona discharger for transferring the developed image onto a transfer member, means including a neutralizer for removing any charge remaining on the surface of the record medium after transfer of the developed image from the record medium, and a cleaning unit for removing any non-transferred toner which may remain on the record medium, said neutralizer comprising a corona discharge wire and a grounded conductive shield plate having two side plates spaced in the direction of movement of said record medium relative to said shield plate, the improvement including means for limiting the electric field produced between the first of said side plates to encounter said record medium and said record medium to a value no greater than 2 kV/cm, said limiting means including spacing said first side plate to encounter said record medium a predetermined distance from said record medium.

4,351,604

MULTI-COLOR ELECTROSTATIC COPYING APPARATUS

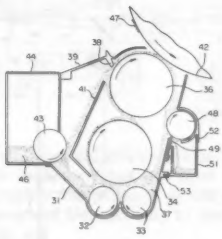
Shuichi Karasawa; Fuyuhiko Matsumoto; Kunihiko Ikeda, and Shuichi Tsushima, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,600

Claims priority, application Japan, Apr. 26, 1979, 54-51916; Jun. 12, 1979, 54-73742; Jun. 21, 1979, 54-78577

Int. Cl.³ G03G *15/01*

U.S. Cl. 355—4 **25 Claims**



1. A multi-color electrostatic copying apparatus including a moving dielectric member, means for forming a bipolar electrostatic image on the dielectric member, first developing means for applying a first toner charged to a first polarity to the dielectric member and second developing means for applying a second toner charged to a second polarity which is opposite to the first polarity to the dielectric member, characterized by comprising:

toner separation means disposed in the second developing means for separating first toner which was removed from the dielectric member while the second developing means applied the second toner to the dielectric member and mixed with the second toner in the second developing means from the second toner, the separation means comprising a separation member charged to the second polarity;

the separation member being positioned such that the first and second toner contact the separation member after the second developing means applies the second toner to the photoconductive member.

4,351,605

CONTROLLED VELOCITY TRANSPORT PRECESSION SYSTEM

Vance J. Carpenter, and Eugene L. Yang, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 11, 1981, Ser. No. 262,353

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **3 Claims**

1. An optical system for scanning a document moving through an exposure zone in an object plane at some absolute speed V_{CVT} and projecting light images of said document along an optical path onto a flat portion of a photoreceptor moving through an image plane at a process velocity V_B, said system including

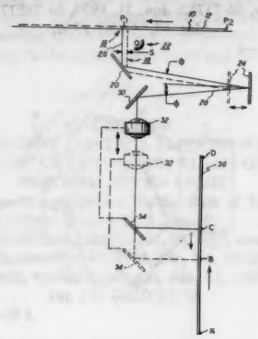
an illumination source for providing a band of illumination at said exposure zone,

a first, stationary mirror reflector positioned adjacent said exposure zone and in said optical path to direct reflections from said illuminated portion of the document onto a second mirror at an incident angle ϕ measured with respect to the mirror normal which is parallel to said object

plane, said second mirror adapted for movement towards said first mirror,

a projection means positioned along the optical path and adapted for translation along said optical axis to project light images reflected from said second mirror onto said photoreceptor,

said optical system having a first mode of operation wherein said second mirror and said projection means remain stationary and wherein V_{CVT}=document scan velocity $Vs=V_B$ and a second mode of operation wherein said second mirror moves towards said first mirror at a velocity Vm2 and said projection means moves along the optical path at a velocity V_L so as to project said light images onto said photoreceptor in a direction opposite to said photoreceptor motion, said movements governed by the following relationships:



$$V_L=(-2Vm2)\cos\phi, V_B=Vs-V_L$$

and

$$V_{CVT}=V_s+2Vm2\sin\phi.$$

4,351,606

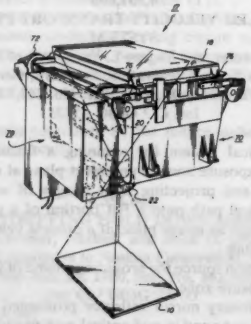
VARIABLE MAGNIFICATION OPTICAL SYSTEM FOR USE IN ELECTROPHOTOGRAPHIC PRINTING

Eugene B. Franko, Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1981, Ser. No. 237,031

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **5 Claims**



1. An electrophotographic printing machine of the type having a variable magnification optical system for adjusting the size of indicia reproduced on a copy sheet from a document, said printing machine including a photoconductive member having at least a portion of the surface thereof charged, said photoconductive member being in communication with the optical system so that exposure of the charged portion of said photoconductive member records an electrostatic latent image thereon, said optical system including a support for holding the document thereon, a light source for illuminating the document on said support, and a lens positioned to receive the light rays transmitted from the document and focusing the light image thereon onto the charged portion of said photoconductive member, the improvement comprising:

means for comparing the size of the surface area of the copy sheet with the surface area of the document and generating a signal indicative of the difference therebetween, said means for comparing including means for detecting the size of the document and generating a document signal corresponding thereto, means for sensing the size of the copy sheet and generating a copy sheet signal corresponding thereto, and means for measuring the difference between the copy sheet signal and the document signal to be generated; and

means, responsive to the signal from said comparing means, for controlling the optical system to adjust the magnification thereof so as to reproduce the indicia of a document on the copy sheet, said controlling means including a motor coupled to said support and said lens so as to move said support and said lens relative to said photoconductive member to adjust the magnification of the indicia being reproduced.

4,351,607

ANALYZER APPARATUS FOR MEASURING AND ADJUSTMENT OF COLOR FILTERING EFFECTS AND/OR EXPOSURE ON MAKING PHOTOGRAPHIC PRINTS

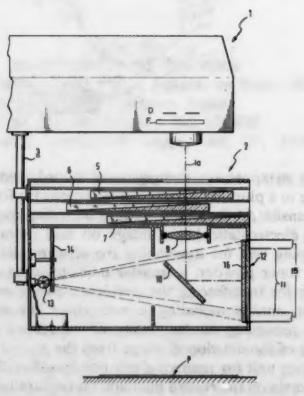
Stefan Reich, Ulrichstrasse 68, D-8026 Irschenhausen, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,103

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016038

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—35 **13 Claims**



1. In a photographic reproduction process,

a method of evaluating spectral composition and brightness characteristics of a color transparency

comprising, in accordance with the invention, the steps of:

projecting at least a major portion of the color transparency on a first portion **(11)** of an image plane **(12, 31)**;

simultaneously projecting white reference light on a second

portion (15) of the viewing screen, positioned closely adjacent said first portion;

observing the projected image of the at least major portion of the transparency;

comparing said projected image with the reference light at the adjacent second portion of the viewing screen;

and adjusting the light intensity of the projected image until the projected image on the first portion of the viewing screen and the projected reference light adjacent second portion of the viewing screen have a predetermined relationship.

4,351,608

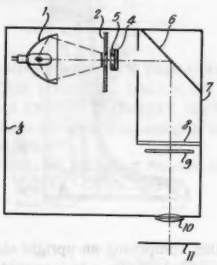
FILTER HEAD

Jack H. Coote, Rochford, and Arthur P. Jenkins, London, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 13, 1979, Ser. No. 49,681

Int. Cl.³ G03B *27/72, 27/76*

U.S. Cl. 355—35 **14 Claims**



1. A lamphouse for use with an enlarger head in the production of prints on variable contrast material or on conventional photographic material in combination with a monochrome negative which comprises a light source from which light is directed to a fixed apertured plate, there being present a composite filter one portion of which passes light in one of two mutually exclusive wavebands and the other portion of which passes light in the other of the two mutually exclusive wavebands, the said composite filter being movably mounted in relation to the said apertured plate so that in one position the light passing the filter is predominantly in one of the said wavebands, and in a second position the light passing the filter is predominantly in the other of the said wavebands, whilst in intermediate positions a varying mixture of light in the two said wavebands is passed, there being present light attenuating means to cut down the amount of light passed in one of the said two mutually exclusive wavebands to which the combination of light source and photosensitive material to be exposed is more sensitive so that prints of equal visual density are obtained by exposures of an equal duration whatever the position of the said composite filter in relation to the apertured plate.

4,351,609

PHOTOGRAPHING APPARATUS

Shunzo Inoue; Takeshi Nagasawa, both of Yokohama; Hitoshi Yanagawa, Tokyo; Toshio Iwaya, Machida, and Michio Kasuya, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,602

Claims priority, application Japan, Feb. 22, 1980, 55/21346; Mar. 17, 1980, 55/33587; Dec. 19, 1980, 55/180238; Jan. 9, 1981, 56/1850; Jan. 9, 1981, 56/1851; Jan. 12, 1981, 56/2877

Int. Cl.³ G03B *27/48, 27/52*

U.S. Cl. 355—50 **21 Claims**

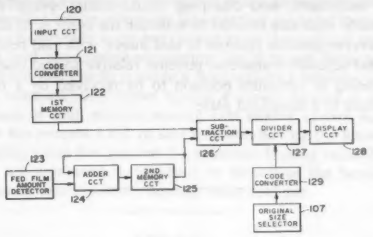
1. A photographing apparatus for photographing originals on a long footage of film, comprising:

a film supply portion for containing unphotographed film therein;

feed means for feeding the film from said film supply portion to a photographing station;

photographing means for photographing originals on the film fed to said photographing station;

measuring means for measuring the length of the unphotographed film contained in said film supply portion;



means for calculating the number of originals photographable on the unphotographed film from the length of the unphotographed film measured by said measuring means and the length of film necessary to photograph originals on the film; and

display means for displaying the number of originals calculated by said calculating means.

4,351,610

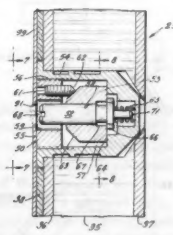
PHOTOCOMPOSER

John P. Skrypek, Mahwah; Robert Williams, Randolph, and Enn Sirvet, Washington Township, Bergen County, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 152,990

Int. Cl.³ G03B *27/04*

U.S. Cl. 355—86 **9 Claims**



1. Photocomposing apparatus including a backboard for receiving a sensitized plate; a light means and film carrier unit disposed in front of said backboard and mounted for relative movement with respect to said backboard with such movement being generally parallel to the front of said backboard to positions wherein said unit confronts selected portions of said backboard; adjustable registration pin means on said backboard for locating a sensitized plate thereon in a predetermined position thereon; said registration means including a plurality of pin assemblies each of which includes a registration pin and mounting means to which said pin is mounted for movement between an extended working position projecting forward of said backboard and a retracted position wherein the forward free end of said pin is disposed behind the front surface of backboard, said mounting means including an insert, a retainer and a support; said insert being fixedly secured to said backboard and disposed behind the front surface thereof, said insert having a chamber extending to the front thereof; said support

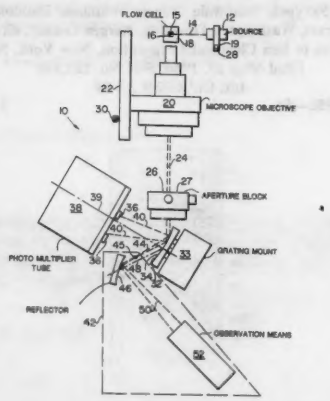
being mounted to said insert and being disposed within said chamber at the front thereof; said retainer being disposed within said chamber to the rear of said support and being transversely adjustable with respect to said insert; said retainer having a front to rear guide aperture closely fitted to said pin and through which the latter extends; said support having a clearance aperture loosely fitted to said pin and through which the latter extends when in said working position; clamping means mounted on said support and operable from the front of said backboard; said clamping means being operatively engageable with said retainer to maintain the latter in its adjusted transverse position relative to said insert; with said retainer in its said adjusted transverse position relative to said insert said pin being in optimum position to be received by a register aperture in a sensitized plate.

4,351,611

MONITORING OF A DETECTION ZONE UTILIZING ZERO ORDER RADIATION FROM A CONCAVE REFLECTING GRATING

Robert C. Leif, Coral Gables, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Sep. 22, 1980, Ser. No. 189,505
Int. Cl.³ G01J 3/18
U.S. Cl. 356—328 **3 Claims**



1. An optical flow system, wherein means are provided for measuring radiation signals generated when particles, which are suspended in a fluid flow, are irradiated in a detection zone, said flow system having a concave reflecting grating disposed to intercept the radiation signals and disperse the radiation signals into a spectrum, said concave reflecting grating substantially having a line focus for "zero order" reflected radiation, the improvement of the flow system comprising:

monitoring means, disposed to receive the reflected radiation from the grating, for observing the detection zone;

said monitoring means including a reflector, the line focus of the grating being disposed between the grating and said reflector, said reflector having a concave surface oriented to receive the reflected radiation from the grating;

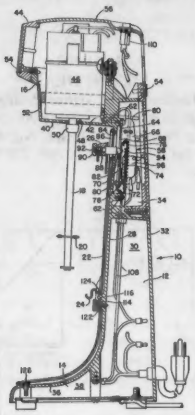
said monitoring means includes observation means, disposed to receive the reflected radiation from said reflector, for observing an image of the detection zone.

4,351,612

DRINK MIXER

Bruno M. Valbona, Farmington, and William C. Pound, Burlington, both of Conn., assignors to Dynamics Corporation of America, Greenwich, Conn.

Division of Ser. No. 234,898, Feb. 17, 1981. This application Jun. 30, 1981, Ser. No. 279,007
Int. Cl.³ B01F 7/26
U.S. Cl. 366—206 **12 Claims**



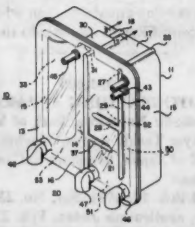
9. A drink mixer comprising an upright standard having a frontwall and spaced sidewalls, a base provided at the lowermost end of said standard, a motor housing containing a motor mounted upon said standard, a stirring shaft depending from said motor housing in spaced relationship to the standard frontwall and terminating above said base, and a splatter shield of unitary construction covering said standard frontwall and curving above said base to cover said base, said splatter shield being removably mounted upon said mixer and extending between said standard frontwall and base and said stirring shaft.

4,351,613

TANKS FOR MIXING APPARATUS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Continuation-in-part of Ser. No. 119,759, Feb. 18, 1980, Pat. No. 4,332,483. This application Jul. 7, 1980, Ser. No. 166,471
Int. Cl.³ B01F 5/06
U.S. Cl. 366—337 **23 Claims**



1. A tank for mixing apparatus for at least one chemical material to be incorporated in a carrier liquid comprising

a molded unitary body portion having a first vertical side wall portion, integral second opposite spaced vertical side wall portions extending from said first vertical side wall portion,

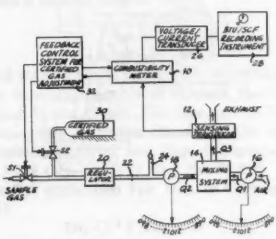
integral third horizontal opposite spaced side wall portions extending from said first side wall portion and joined at their ends to the ends of said second vertical side wall portions,
said body portion having a peripheral flange extending from said second and third side wall portions and parallel to said first side wall portion,
a vertical cover closing said body portion and in engagement with said peripheral flange,
said integral third horizontal side wall portions including a top wall,
partition members in engagement with said first vertical side wall portion and said vertical cover,
said partition members separating the interior of the body portion into a plurality of communicating spaces at least one of which is for component introduction at least one of which is for mixing, and another of which is for storage of mixed material,
means for introducing into said space for component introduction a carrier liquid and at least one chemical to be added,
said top wall portion having a struck out portion providing a space into which one of said partition members extends for preventing return of fluid.

4,351,614

METHOD OF AND APPARATUS FOR CONTINUALLY MONITORING THE HEATING VALUE OF A FUEL GAS USING A COMBUSTIBILITY METER

John J. Garnier, Hales Corners, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 19, 1980, Ser. No. 131,568
Int. Cl.³ G01N *25/54*
U.S. Cl. 374—37 **13 Claims**



1. A method of continually monitoring the heating value of a fuel gas, comprising the steps of:
mixing a fuel gas of known heating value with a combustion-supporting gas, in a controlled ratio, to make a homogeneous mixture;
measuring the percent of lower explosive limit of said fuel gas;
setting said ratio of fuel gas to combustion-supporting gas such that the ratio is 100% of the LEL of the fuel gas;
substituting in said mixture a fuel gas of unknown heating value for said fuel gas of known heating value, without changing said ratio of fuel gas to combustion-supporting gas;
and converting the resulting percent of LEL of said fuel gas of unknown heating value into the heating value of said fuel gas.

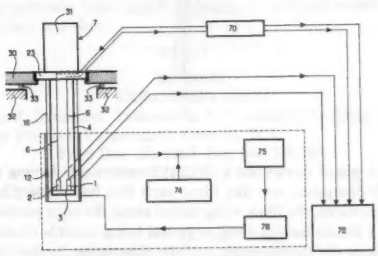
7. An apparatus for continually monitoring the heating value of a fuel gas, comprising:
a mixing system;
means for selectively feeding either fuel gas of known heating value or fuel gas of unknown heating value to said mixing system comprising:
a source of fuel gas of known heating value;
one or more sources of fuel gases of unknown heating values;
a first pump connected between said sources of fuel gases and said mixing system to force said fuel gases into said mixing system at a controlled rate;
and selectively controllable means for admitting first said known heating value fuel gas and thereafter one of said unknown heating value fuel gases to said first pump;
and means to control the ratio of the selected fuel gas and a combustion-supporting gas fed to said mixing system comprising:
a source of combustion-supporting gas;
a second pump to force said combustion-supporting gas into said mixing system at a controlled rate with respect to the controlled rate at which the selected fuel gas is fed thereto so as to provide a predetermined ratio thereof and such that said combustion-supporting gas is mixed with said selected fuel gas to provide a homogeneous mixture;
and a combustibility meter having a sensor located in the stream of said mixture leaving said mixing system such that the percent LEL of said mixtures having the known heating value fuel gas and the unknown heating value fuel gas are measured in sequence to determine the heating value of said unknown heating value fuel gas.

4,351,615

DIFFERENTIAL DILATOMETER

Carlos A. Vettori de Almeida Rodrigues, 30, rue Gassendi, 75014 Paris, France

Filed Oct. 29, 1980, Ser. No. 201,754
Claims priority, application France, Nov. 5, 1979, 79 27215
Int. Cl.³ G01N *25/15*
U.S. Cl. 374—56 **10 Claims**



1. A differential dilatometer for simultaneously measuring, particularly at low temperatures, the relative expansion of two different solid test samples, one of which may be a reference sample whose thermal expansion is accurately known or the absolute expansion of the samples, the test sample and the reference being mounted in a support tube, the variation in length of the test sample and the reference being transferred by two push rods which extend inside the support tube, into a measuring head where one push rod supports the coil of a linear variation differential transformer and where the other push rod supports the core of the linear variable differential transformer, the output signal of said transformer being fed to an amplifier whose output is proportional to the differential expansion between the two test samples, wherein the support tube (4) and the two push rods (6) are vertical, the support tube being situated below the measuring head (7); the support tube (4) is at least partially mounted inside a cryostat (8) which allows the circulation of a cryogenic fluid, during measurements, around the test sample (1) and the reference (2), the region of the support tube (4) where the test sample (1) and the reference (2) are mounted being, furthermore, surrounded by an electric heating sleeve (12) embodied inside the cryostat (8), the amount of heat supplied by the heating sleeve (12) being controlled and regulated by means of a temperature regulation system, said heating sleeve avoiding a direct contact between the cryogenic fluid and the test samples, the electric heating sleeve (12) being secured at its upper end to the base of a

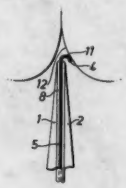
protection tube (16) which is of a poor heat conducting material and which surrounds the support tube (4), the cryostat embodying the base of the protection tube (16), wherein both push rods (6) and the support tube (4) are made of vitreous silica, the electric heating sleeve (12) is of a good heat conducting metal, the protection tube (16) is made of stainless steel and is secured to the upper end of the heating sleeve (12), the protection tube (16) and the electric heating sleeve (12) are suspended and removably secured to the lower part of a plate (23) made of a poor heat conducting material, the dilatometer head (7) being secured to and above the plate, said plate being secured below a heavy platform (30) which rests on a support frame (32) supported by anti-vibration means (33), and the support tube (4) being supported by the dilatometer head (7).

4,351,616

THERMOMETER GUARD

Sven E. Färnström, Trangsviken, and Hans Andersson, Nälden, both of Sweden, assignors to Minitube NYA AB, Trangsviken, Sweden

Filed Jun. 4, 1980, Ser. No. 156,341
Claims priority, application Sweden, Jul. 2, 1979, 7905777
Int. Cl.³ G01K *1/08*
U.S. Cl. 374—209 **2 Claims**



1. A guard device for a clinical thermometer having a tip, which comprises two like films, each film having two lateral edge portions, the films being united along the edge portions to form a sheath having a top edge and being capable of accommodating the thermometer and the films being further united by a joint at an end of the sheath spaced from the top edge, the joint having an arcuate shape conforming to the shape of the tip of the thermometer and the joint constituting a stop spaced from the top edge for the tip of the thermometer accommodated in the sheath, the united films constituting a bendable flap between the joint and the top edge, and the arcuate joint being shaped to permit communication between the interior of the sheath and of the flap, the flap exposing only smooth film surfaces to a body opening of a patient when the flap is bent upon movement of the thermometer accommodated in the sheath into the body opening.

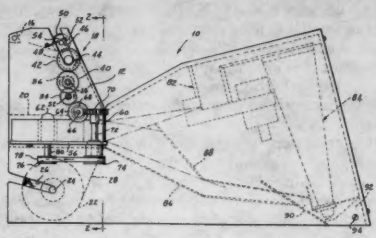
4,351,617

MICROBALLISTIC PRINTER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 39,372, May 5, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,891
Int. Cl.³ B41J *3/02*
U.S. Cl. 400—118 **18 Claims**

4. Apparatus for applying printing material to a medium including in combination a platen for supporting said medium, means for successively propelling a plurality of solid projectiles one by one in free flight toward said medium from a location spaced from said medium, and means for orienting said propelling means to control the respective flight paths of



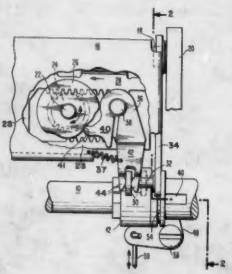
said projectiles to impact the medium in a desired intelligible information pattern.

4,351,618

SELECTION CONTROLLED PRINT IMPRESSION CONTROL FOR SINGLE ELEMENT IMPACT PRINTERS

Mike Prewarski, El Paso, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,469
Int. Cl.³ B41J *1/60*
U.S. Cl. 400—166 **23 Claims**



1. A print velocity control apparatus for a typewriter having a single print element, comprising:

means for impacting said single print element against a record sheet with one of a plurality of velocities, and

cam means rotationally coupled to and rotatable with said single print element for selecting a velocity of impact of said single print element in accordance with character positions on said single print element.

4,351,619

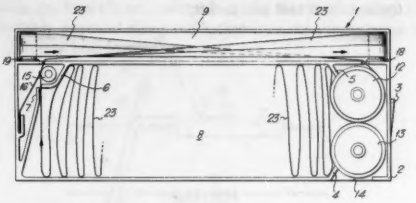
INK RIBBON CASSETTE

Douglas Duke, Brighton, England; Reinhold Drodofsky, and Folker Galaske, both of Pforzheim, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 28, 1980, Ser. No. 211,228
Claims priority, application United Kingdom, Nov. 29, 1979, 7941277
Int. Cl.³ B41J *33/10, 32/02*
U.S. Cl. 400—196.1 **5 Claims**

1. An inked ribbon cassette comprising: an endless inked ribbon; a housing defining a first partial enclosure to hold said inked ribbon in a serpentine configuration with the ribbon surface having an elongated major dimension and a minor dimension perpendicular to said major dimension, said housing defining a second partial enclosure to hold said ribbon in place for use, said first and second partial enclosures being separated

by a common wall, said housing having first and second parallel slots through, but at opposite ends of said common wall to permit said ribbon to exit from said first partial enclosure to said second partial enclosure and to enter said second partial enclosure from said first partial enclosure, said common wall being parallel to said ribbon surface minor dimension; first and second pulleys adjacent to said first and second slots, respectively, said first and second pulleys having respective parallel first and second axes perpendicular to the said common wall said ribbon exiting said first slot, and having a first portion



twisting 90 degrees and extending around said second and first pulleys in succession in the same circumferential direction about each pulley and having a second portion twisting 90 degrees and passing through said second slot, said first and second twisting portions of said ribbon overlying each other and being spaced apart a distance very small in comparison to the distance between said axes; and means mounted in said housing to pull said ribbon through said second slot into said first parallel enclosure, said ribbon twisting portions forming said ribbon into a Mobius loop.

4,351,620

DEVICE FOR FASTENING BUILT-IN WIRING DEVICES

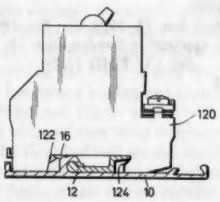
Helmut Stritt, Schwetzingen; Alfred Schmidt, Beerfelden-Gammelsbach, and Erwin Leible, Eberbach, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Oct. 24, 1979, Ser. No. 87,890

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846443

Int. Cl.³ F16B *1/00*

U.S. Cl. 403—13 **14 Claims**



1. Device for fastening built-in wiring equipment, the bottom of the wiring equipment having a fixed projection for engaging behind one L-shaped extension of a support channel having two L-shaped extensions facing away from each other, and a movable projection for snapping behind another L-shaped extension thereof, comprising a support plate having means integral therewith for mounting a bus bar to hold wiring equipment and a first L-shaped extension engageable with a projection of the wiring equipment, and a support strip attachable to said support plate and having a second L-shaped extension integral therewith, said first and second extensions forming together a support channel having two L-shaped extensions facing away from each other.

4,351,621

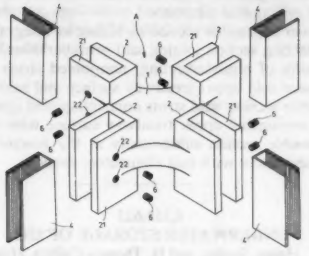
CONNECTOR FOR COMBINATION FURNITURE

Jin S. Liou, No. 315-319, Sec. 5, Yen-Pin N. Rd., Taipei, Taiwan

Filed Dec. 19, 1979, Ser. No. 105,301

Int. Cl.³ F16D *1/00, 3/00*

U.S. Cl. 403—217 **1 Claim**



1. A connector for connecting together sheet members having separated, flat parallel extending surfaces to form pieces of furniture comprising:

a connector body having a central axis and defining four U-shaped open ended slots extending outward from said axis with the open end of each said slot facing outward for receiving a sheet member;

a U-shaped plastic liner in each said slot between the interior walls of that slot and said sheet; and

a set screw in a threaded hole through a wall of each slot for contacting said liner for locking a received member in place in a slot.

4,351,622

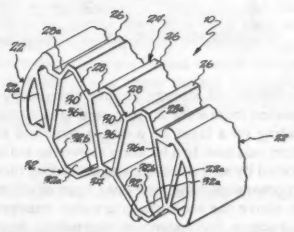
EXPANSION SEAL

James J. Kerschner, Tonawanda, N.Y., assignor to Acme Highway Products Corporation, Amherst, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,701

Int. Cl.³ E01C *11/10*

U.S. Cl. 404—64 **7 Claims**



1. A seal adapted to be connected between a pair of spaced-apart structural members defining a gap therebetween in an expansion joint assembly, said seal comprising:

an elongated body having longitudinal edges and including a mounting portion extending along each of its longitudinal edges for coaction with the structural members in the installed position of said seal; and

an intermediate expansion portion formed integral with said mounting portions comprising;

an upper treadway surface formed with at least three integrally connected corrugated members, each of said corrugated members having a substantially planar central surface and a pair of downwardly and outwardly inclined legs extending from said central surface, the legs of adjacent corrugated members being joined and defining at the

joinder thereof a substantially V-shaped groove, the outer legs of the outermost corrugated members being integrally connected to said mounting portions,

a lower expansible section spaced vertically below said upper treadway surface and formed with at least two laterally spaced protuberances which are in substantial vertical alignment with said central surface of said outermost corrugated members,

said lower expansible section including an integrally formed connecting section joining said protuberances, and

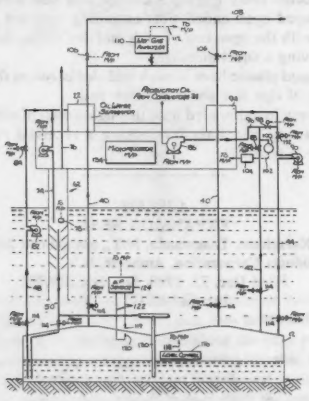
a plurality of nonintersecting, non-joined struts extending between said upper treadway surface and said lower expansible section, said struts connecting said joined legs of said corrugated upper treadway surface with said lower expansible section substantially at the junctures of said protuberances with said connecting section.

4,351,623

UNDERWATER STORAGE OF OIL

Edward J. Heinz, Spring, and H. Thomas Collins, Houston, both of Tex., assignors to Raymond International Builders, Inc., Houston, Tex.

Filed Jun. 10, 1980, Ser. No. 158,071
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—210 **19 Claims**



1. An offshore oil storage facility comprising an enclosed tank supported from a sea bottom, said tank containing a layer of oil floating on a layer of water, a structure extending upwardly from said tank to a location above the sea surface, an oil line supported by said structure and extending therealong from a location communicating with said layer of oil in said tank to a location above the sea surface, a water standpipe supported by said structure and extending therealong from a location communicating with said layer of water to a submerged location above said tank and an oil containment casing comprising a tubular shell surrounding the upper end of said water conduit means and extending from a location below said upper end to a location above the sea surface, said tubular shell being open to the sea below the upper end of said water standpipe.

4,351,624

FILE AND JACKET CONSTRUCTION METHOD AND APPARATUS

Ronald A. Barber, 519 S. Harrison St., West, Tex. 76691

Filed Oct. 15, 1979, Ser. No. 84,842
Int. Cl.³ E02B *17/00*; E02D *13/00*
U.S. Cl. 405—228 **9 Claims**

1. A method of constructing a pile extending through the bottom of a body of water which comprises the steps of:

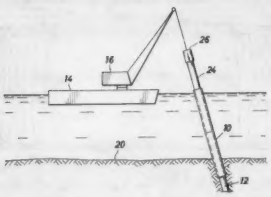
(a) positioning a pile jacket at a desired location and angle relative to the bottom of a body of water and driving the pile jacket into the bottom to a specified depth;

(b) temporarily storing within the pile jacket a first pile segment preliminary to the step of positioning the pile jacket said temporary storage being accomplished by connector link means releasably secured to internal eyelet means of both said pile segment and pile jacket;

(c) releasing said connector link means from said eyelet means after driving said pile jacket;

(d) removing said internal eyelet means of said pile jacket;

(e) raising the pile segment to expose one end thereof protruding from said pile jacket;



(f) joining a second pile segment serially to said pile segment by welding, a strongback being positioned within the adjacent extremities of said first and second pile segments prior to said welding, said strongback aligning said pile segments;

(g) driving the first pile segment and second pile segment into the bottom through said pile jacket; and

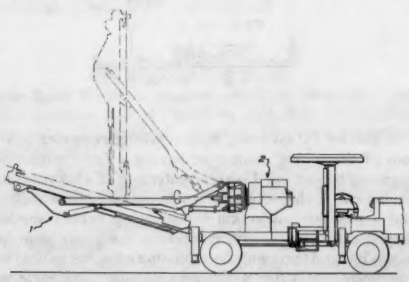
(h) alternately adding additional pile segments to the pile segment aligned and positioned within the pile jacket and driving the pile segments serially through the pile jacket into the bottom and continuing such alternation until the several pile segments form a pile having a specified length and extending through the bottom to a specified depth.

4,351,625

APPARATUS FOR AUTOMATIC BOLTING IN ROCK REINFORCEMENT

Berndt Selestam, DalarUMLo/; Ake Forssell, Västerhaninge, and Per A. Winnersjö, Handen, all of Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

PCT No. PCT/SE79/00134, § 371 Date Feb. 13, 1980, § 102(e) Date Feb. 6, 1980, PCT Pub. No. WO80/00093, PCT Pub. Date Jan. 24, 1980
PCT Filed Jun. 13, 1979, Ser. No. 189,925
Claims priority, application Sweden, Jun. 13, 1978, 7806833
Int. Cl.³ E21D *11/00*
U.S. Cl. 405—303 **3 Claims**



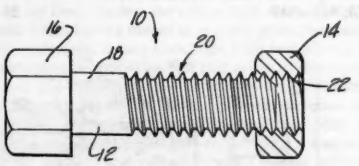
1. An apparatus for automatic bolting in rock reinforcement operations, the apparatus comprising a supply beam (6), which carries a drill (3), an injector, a bolting machine (5), a working position adjustment device (9) which has sockets (10, 11, 12)

for accommodating a drill bit (13), the forward end of the hose (14) of the injector, a bolt, and a positioning rod (15) which is fixedly mounted at the forward end of the supply beam and is brought into abutment with the rock face for directing, by means of the apparatus, in sequence, the drill bit, the hose and the bolt at a point on the rock face for the purposes of accomplishing the rock reinforcement operation, characterized in that a machine carriage (7), which during operation is adapted to accommodate the drill (3) or the bolting machine (5), is movable along the supply beam (6), and that a linear machine shifter switch (8), by means of which the drill (3) and the bolting machine (5) are insertable on the machine carriage (7), is shiftably disposed along and lockable on the supply beam (6) for different bolt lengths.

4,351,626
SELF-LOCKING THREADED FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024

Filed Apr. 18, 1980, Ser. No. 141,535
Int. Cl.³ F16B 39/30
U.S. Cl. 411—311 22 Claims



1. A self-locking fastener combination, comprising:

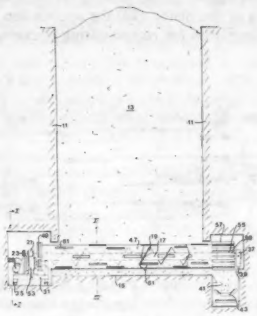
a first member having a helical thread formed thereon including leading and trailing flanks lying at respective first and second angles to the longitudinal axis of said fastener combination and which, before threaded engagement with another member, converge toward a crest of substantially constant diameter over the working length of said first member; and

a second member matingly threadable with said first member and having a thread formed thereon including leading and trailing flanks converging toward each other to define a root for receiving the crest of said first member therewithin, said last named leading and trailing flanks lying at respective third and fourth angles with respect to said longitudinal axis, said root being truncated along at least a portion of the thread of said second member to provide a root surface extending between the corresponding leading and trailing flanks of said second member, said portion of the thread of said second member including the truncated root having a thread depth of lesser dimension than the thread of said first member in order to cause firm radial engagement of the crest of said first member with the root surface of said second member whereby to deform at least a portion of said crest, said third angle being greater in magnitude than said first angle whereby the leading flank of said first member diverges away from the leading flank of said second member associated with said thread portion to form an open space adjacent said root surface for receiving the deformed portion of said crest of said first member, the trailing flanks of said first and second members being in substantial face-to-face frictional engagement along said portion of the thread of said second member.

4,351,627
DEVICE WITH SCREW CONVEYOR FOR DISCHARGING BULK MATERIAL

Georg L. K. Forsberg, Nylandsgatan 14, 654 65 Karlstad, Sweden

Continuation-in-part of Ser. No. 845,838, Oct. 26, 1977, abandoned. This application Apr. 29, 1980, Ser. No. 144,943
Claims priority, application Sweden, Oct. 26, 1976, 7611862
Int. Cl.³ B65G 65/46
U.S. Cl. 414—312 28 Claims



1. A device for discharging bulk material from a store thereof, comprising: a rotary screw conveyor rotatable about a longitudinal axis, and surrounded by an elongated drum which is rotatable independently of the screw conveyor; means providing inlet apertures distributed over the periphery and along the length of the cylindrical face of said drum; means for mounting said rotary screw conveyor and drum for movement over a floor in a straight path perpendicular to said longitudinal axis with said drum spaced a predetermined distance from the floor; means for powering said conveyor and said drum in said straight path; means for effecting rotation of said rotary screw conveyor and said drum; and means for preventing detrimental deflection of said drum during long periods of non-use due to settling and compaction of the bulk material, while not interferring with the rotation of and movement of said drum in said straight line path during use, and facilitating rotation of said drum during start-up after a long period of non-use, said means comprising a strip of material disposed on the floor and extending generally in said straight line path, and having an upper surface, said upper surface upstanding from the foor a distance less than the spacing of the drum from the floor during rotation of the drum.

4,351,628
ARTICLE HANDLING AND TRANSFER APPARATUS UNIT

Peter Drexel, Steinenbronn; Gernot Maier, Stuttgart, and Ernst Leisner, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,558
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914650
Int. Cl.³ B65G 47/90
U.S. Cl. 414—749 18 Claims

1. An article handling and transfer apparatus unit having an elongated housing (10), having two end flanges (19, 20);

a bore forming a cylinder (11) in the elongated housing;

a piston (23) within the cylinder;

a piston rod (13) forming a positioning rod connected to the piston and extending through at least one (19) of the end flanges (19, 20) of the housing, said apparatus unit further comprising

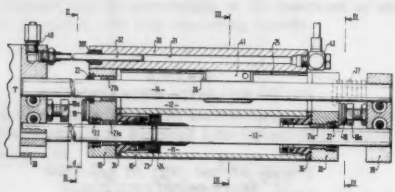
a hollow chamber (12) extending parallel to the cylinder (11) in the housing;

a guide rod (**14**) located in said hollow chamber;

a guide opening formed in the at least one end flange (**19**), the guide rod extending through said guide opening and moveable parallel to said piston rod with respect to said end flange;

at least one receiver attachment flange (**38, 39**) connected to at least the end of the positioning and piston rod (**13**) as well as to the guide rod (**14**) externally of said end flange, to additionally maintain said guide rod and said positioning rod in parallel relationship;

pressure fluid supply means passing through said housing at both sides of the piston (**23**) for application of a pressure fluid to the piston for reciprocating operation thereof;



at least two longitudinal extending bores (**15, 17**) passing through the housing forming energy transmission ducts or channels for transfer of energy in at least one of the forms: pressurized fluid; electricity

through the housing for transfer of energy longitudinally of the housing;

the end flanges (**19, 20**) closing off the end portion of the housing, said end flanges including

bearing means (**21***a*, **21***b*) guiding said positioning and piston rod (**13**) for longitudinal operation in the housing and said guide rod (**14**) for longitudinal operation therein,

the pressure fluid supply means including

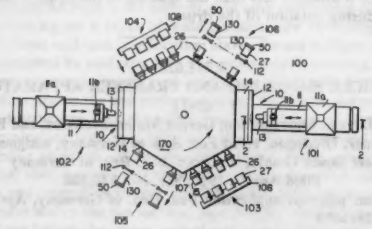
connection means (**15***a*, **16**) for connection of pressurized fluid to both sides of the piston (**23**) within the cylinder (**11**) formed in the housing.

4,351,629

PLASTIC END CAPPING MACHINE

John J. Farrell, 40 Abby La., Greenbrook, N.J. 08812

Filed Aug. 8, 1980, Ser. No. 176,282
Int. Cl.³ B29F *1/00*; B29C *1/00*
U.S. Cl. 425—116 **12 Claims**



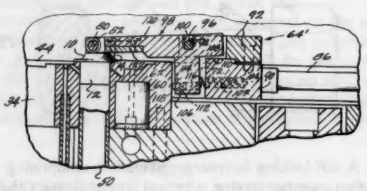
1. An end capping machine for making an integral, wide mouth container, said machine comprising a head having means to rotatably index said head at a plurality of stations; a plurality of core rods mounted on and outwardly disposed from said head so as to be indexed at said stations, said stations comprising a first station comprising means to load sleeves on said core rods, a second station comprising means to injection mold a thermoplastic end cap on first ends of said sleeves so as to form containers, and a third station comprising means to unload said containers, further comprising a core rod onto which said sleeve is inserted, said core rod being disposed within the mold, said core rod further comprising an annular member disposed around the periphery of the core rod and extending radially outwardly from said core rod and being formed on one portion to engage the other end of the sleeve so as to take up the thrust of the injection molding of thermoplastic onto the sleeve, said mold comprising partible sections and means to open and close said partible sections, whereby said sleeve is held on said core rod between the closed partible sections, said mold sections being formed with recessed portions so as to contactingly engage said annular member, said member being formed with a second portion so as to comprise seating means for said partible mold sections, said mold being formed with an annular portion disposed radially outwardly from said one end of said sleeve so as to provide a cavity at both the first end and outside periphery of said sleeve adjacent said first end, whereby thermoplastic flows into the cavity and around the first end of said sleeve so as to be formed and bonded to the sleeve, thereby providing an integral wide-mouth container at said second station.

4,351,630

PIVOTING HINGE EXERCISING MECHANISM

Robert S. Hayberg, Pembroke Lakes, and Eugene L. Foltuz, Hollywood, both of Fla., assignors to Global Precision Inc., Hollywood, Fla.

Filed Dec. 31, 1980, Ser. No. 221,917
Int. Cl.³ B29D *31/00*
U.S. Cl. 425—517 **23 Claims**



1. A device for exercising a living hinge of an article while in a mold for forming said article, said device comprising:

a finger including a portion adapted for engagement with said article;

means for slidably connecting said finger to said mold, said connecting means enabling said finger to slide in a first direction transverse to said hinge from a first position to a second position and enabling said finger to move in a second direction having a component normal to said first direction after said finger has reached said second position, said connecting means being oriented to enable said finger to engage a portion of said article and rotate said article portion about said hinge as said finger moves in said first and second directions; and

means for driving said finger.

2. In a mold for forming an article having a living hinge, a device for exercising said hinge while said article is in said mold, said device comprising:

a finger including a portion adapted for engagement with said article;

means for slidably connecting said finger to said mold, said connecting means enabling said finger to slide in a first direction transverse to said hinge from a first position to a second position and enabling said finger to move in a second direction having a component normal to said first direction after said finger has reached said second position, said connecting means being oriented to enable said finger to engage a portion of said article and rotate said article portion about said hinge as said finger moves in said first and second directions; and

means for driving said finger.

4,351,631

TRANSFER DEVICE FOR PARISONS AND FINISHED PRODUCTS IN INJECTION BLOW MOLDING DEVICES

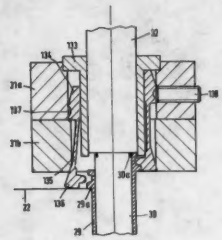
Dieter Gessner, Karben, and Lothar Ott, Schwalbach, both of Fed. Rep. of Germany, assignors to tpT Machinery Corporation, Norwalk, Conn.

Filed Jun. 26, 1980, Ser. No. 163,196

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1979, 2927642

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—533 18 Claims



1. Transfer device for open neck articles in injection blow molding equipment to protect the neck from distortion comprising a pin-like means which is attached to a plate and is operative for insertion into the article, said device including an elongated collet having means at one end contacting said neck and said equipment, means associated with said pin-like means for transmitting pressure through said collet to said equipment when said pin-like means contacts said neck, wherein said collet is movable between a first position and a second position and supported between said pin-like means and plate so that said collet grips said neck and prevents distortion thereof when in said first position and releases it when in said second position, whereby pressure from said pin-like means and plate is transmitted away from said neck through said collet.

4,351,632

BURNER WITH SUPPRESSED NO_x GENERATION

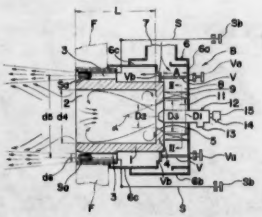
Kiyokazu Nagai, Yao, Japan, assignor to Chugairo Kogyo Kaisha Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 921,172, Jun. 30, 1978, abandoned. This application Apr. 1, 1980, Ser. No. 136,394

Claims priority, application Japan, Jul. 1, 1977, 52-79410

Int. Cl.³ F23M *9/00*

U.S. Cl. 431—183 4 Claims



1. A burner with suppressed NO_x generation for use with a furnace in which combustion air is divided into primary combustion air and secondary combustion air for two-stage combustion, said burner comprising;

a housing for maintaining a supply of the combustion air under pressure, said housing having an outer wall and a peripheral wall provided with an inlet of the supply of the combustion air;

a hollow cylindrical member constituting a primary combustion chamber, and contiguous to said peripheral wall of said housing, said primary combustion chamber having dimensions represented by the following equations,

$$d_4 = 217R^{\frac{1}{4}}$$

$$L = 368R^{\frac{1}{4}}$$

wherein d_4 is the internal diameter in mm of the primary combustion chamber, R is the burner output (10^6 Kcal/h), and L is the length in mm of the primary combustion chamber;

a plurality of secondary combustion air nozzles provided around and outside said primary combustion chamber in a direction parallel to the axis of said primary combustion chamber and operatively connected to said housing for supplying the secondary combustion air into the furnace in the form of a rectilinear flow, said secondary combustion air nozzles each having dimensions represented by,

$$d_6 = 32R^{\frac{1}{4}}$$

where d_6 is the internal diameter in mm of each of the secondary combustion nozzles;

a primary combustion air nozzle of a frusto-conical shape coaxially formed in an end wall provided at one end of said primary combustion chamber and narrowed toward said primary combustion chamber, said primary combustion air nozzle of a frusto-conical shape having dimensions represented by,

$$D_2 = 121R^{\frac{1}{4}}$$

$$170(R+0.25)^{\frac{1}{4}} \leqq D_3 \leqq 204(R+0.25)^{\frac{1}{4}}$$

wherein D_2 is the minimum diameter in mm of the primary combustion air nozzle of a frusto-conical shape open at the side of the primary combustion chamber and D_3 is the large diameter in mm of the primary combustion air nozzle open at the side of a vortex chamber;

said vortex chamber being provided between said end wall of said primary combustion chamber and said outer wall of said housing and communicated with said primary combustion air nozzle for imparting a powerful swirling motion to the primary combustion air so as to introduce the primary combustion air into said primary combustion chamber, said vortex chamber being defined by a plurality of swirling vanes equally spaced and arranged to form said vortex chamber, and having dimensions represented by,

$$141R < I < 196R$$

wherein I is the minimum total inlet area in cm^2 between two adjacent blades of the swirling vanes; and

a fuel injector nozzle coaxially disposed in said vortex chamber to confront said primary combustion chamber for supplying fuel into said primary combustion air nozzle.

4,351,633

METHOD OF RECOVERING THE SENSIBLE HEAT OF CONTINUOUSLY CAST SLABS

Artur Ortner, and Rudolf Zeller, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 3, 1980, Ser. No. 193,548

Claims priority, application Austria, Oct. 18, 1979, 6790/79

Int. Cl.³ F27D *15/02*

U.S. Cl. 432—77 7 Claims

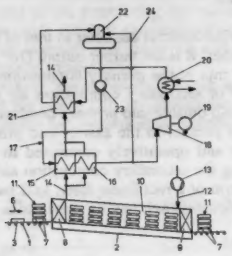
1. In a plant for recovering the sensible heat of continuously cast slabs, of the type including a cooling chamber having an entry lock and an exit lock and transporting means for transporting the slabs, after having been sheared to length, through said cooling chamber, the improvement comprising

an inlet conduit running into said cooling chamber in the region of said exit lock for delivering a first fluid medium into direct contact with the slabs in said cooling chamber,

an exhaust conduit connected to said cooling chamber in the

region of said entry lock for removing the first fluid medium from said cooling chamber,

a first heat exchanger provided in said exhaust conduit for transferring the heat of the first fluid medium to a second fluid medium,



means for moving the first fluid medium through said inlet and exhaust conduits,

means for utilizing the heat of said second fluid medium, and

means for recirculating said second medium between said heat exchanger and said means for utilizing.

4,351,634

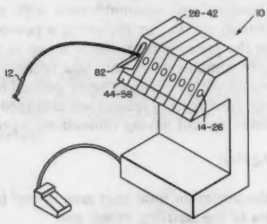
PRIORITY SYSTEM DENTAL INSTRUMENT DELIVERY

Wolfgang Rosenfeldt, Bad Bergzabern, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed May 15, 1980, Ser. No. 150,056

Int. Cl.³ A61C *1/02*

U.S. Cl. 433—28 **1 Claim**



1. A dental instrument delivery unit having a delivery priority system comprising:

a dental unit holding a plurality of dental instruments in individual nests;

an instrument selection switch corresponding to each nest and providing a signal upon activation by an operator;

extending means corresponding to each instrument selection switch for extending the nest corresponding to that switch upon receipt of a release signal;

a priority circuit which provides a selection period running from the first time any instrument selection switch is activated, and upon expiration of the selection period causes a release signal to be directed to the extending means corresponding to the instrument selection switch last activated within the selection period, or if two instrument selection switches are simultaneously activated last, directing a release signal to the extending means corresponding to the activated switch futhermost from the operator.

4,351,635

DRIVE SYSTEM FOR MARINE VESSELS

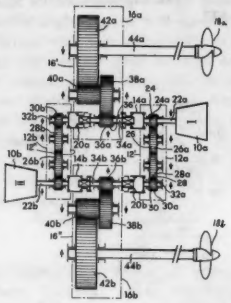
Otto Staedeli, Menzingen, Switzerland, assignor to Maag Gear-Wheel & Machine Co. Ltd., Zürich, Switzerland

Filed Oct. 1, 1979, Ser. No. 80,187

Claims priority, application Switzerland, Oct. 13, 1978, 10644/78

Int. Cl.³ B63H *23/10*

U.S. Cl. 440—75 **6 Claims**



1. A drive system for a marine vessel comprising:

at least two drive units;

at least two propellers driven by said drive units;

a gearing system for operatively interconnecting the propellers with one another;

said gearing system comprising drive pinions;

a respective first switchable clutch for connecting one of the drive pinions with one of the related drive units;

a further respective second switchable clutch provided for each drive pinion;

each drive pinion being arranged between the first switchable clutch, operatively associated with said drive pinion for connecting such drive pinion with the related drive unit, and the further second switchable clutch;

said gearing system for interconnecting both of the propellers comprising two substantially parallelly arranged gear trains;

each gear train being continuously connected with a related one of the drive units; and

each further switchable second clutch connecting the gear train of the related drive unit with the drive pinion of the other drive unit.

4,351,636

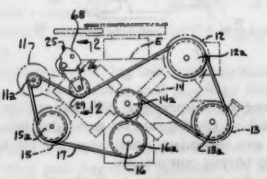
BELT TENSIONING DEVICE

Clarence H. Hager, 3408 Corbridge Lane, Rockford, Ill. 61107

Filed Jun. 6, 1980, Ser. No. 157,101

Int. Cl.³ F16H *7/12*

U.S. Cl. 474—135 **19 Claims**



1. A belt tensioning device for tensioning an endless belt entrained over pulleys on an apparatus, the tensioning device comprising, a pulley support arm, a mounting bracket, means

mounting said pulley support arm on said mounting bracket and on said apparatus for pivotal movement relative thereto about a pivot axis, anchor means for retaining the mounting bracket in a preselected position on the apparatus, an idler pulley mounted on the free end of said pulley support arm for rotation about a pulley axis spaced from and parallel to said pivot axis, spring means for yieldable biasing said support arm in a direction to press the idler pulley against the belt, one of the items comprising support arm in a direction to press the idler pulley against the belt, a pair of vibration dampening pads formed of resilient material and each having a pad face, means fixedly mounting the pads on the side walls of one of the items comprising the support arm and mounting bracket at locations spaced outwardly from the pivot axis with the pad faces slightly engaging respective ones of the side walls of the other of said items and with the pads compressed in a direction perpendicular to the side walls on said other of said items to pressurize the pad faces into engagement therewith.

4,351,637

PRECISION CHAIN DRIVE

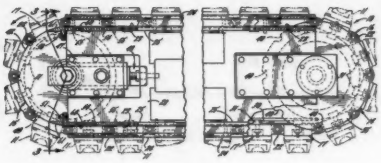
Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Apr. 28, 1980, Ser. No. 144,591

Int. Cl.³ B65G *21/20*

U.S. Cl. 474—148 **4 Claims**

1. A precision chain drive comprising a sprocket wheel and an idler wheel rotatable about spaced parallel axes, drive means for rotating said sprocket wheel, the periphery of said sprocket wheel being formed with angularly spaced pockets, an endless chain trained around said wheels, said chain being formed by an even number of pivotally interconnected links, rollers carried by said links and adapted to enter said pockets whereby said sprocket wheel drives said chain, and means for guiding said chain and causing opposite runs of the chain to travel along straight parallel paths as the runs move between said wheels, said precision chain drive being characterized in that the diameter of said idler wheel is smaller than the effective diameter of said sprocket wheel, first means for holding



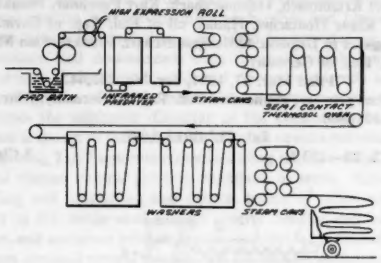
each roller out of engagement with the periphery of said idler wheel as the roller first starts to move out of a straight path and around the idler wheel, said first means enabling each roller to engage said idler wheel after the roller has moved a predetermined distance around the idler wheel, and second means for camming each roller out of engagement with said idler wheel after the roller has progressed around the idler wheel and a predetermined distance before the roller starts to move in a straight path.

4,351,638

PROCESS OF REACTIVELY DYEING AND PRINTING TOWELING

James E. Finlayson, III, Winston-Salem; Joseph P. Holder, Greensboro; L. Earl Holt, Burlington, all of N.C., and Seung Y. Lee, Rochester, N.Y., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 21, 1981, Ser. No. 304,042
Int. Cl.[3] D06P 5/15; C09B 62/00
U.S. Cl. 8—463 14 Claims



1. A process of dyeing cotton-containing toweling comprising the successive steps of:

(a) applying to a cotton or cotton-containing toweling a dyebath solution containing a coloring amount of at least one phosphonic acid fiber reactive dye together with sufficient acid such that the fiber-reactive dye reacts with and attaches to the cotton of the toweling;

(b) passing the dyebath-saturated toweling from step (a) through a high expression roll until the wet pickup is in the range of about 45 to about 55% wpu;

(c) heating the dyebath-containing toweling of step (b) to a temperature of at least 200° F. for a time sufficient to fix the dye onto the cotton thereby producing a fully penetrated, evenly dyed toweling.

4,351,639

PROCESS FOR LIMING PELTS OF ANIMAL HIDES AND SKINS

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 122,041, Feb. 19, 1980, Pat. No. 4,310,328.
This application Jun. 8, 1981, Ser. No. 271,787
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911401
The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.
Int. Cl.[3] C14C 1/08
U.S. Cl. 8—94.16 11 Claims

1. A method for liming animal skins and hides which comprises treating said skins and hides in a bath of an aqueous alkaline liming liquor comprising from 0.02 to 1 percent, by weight of the skins and hides, of a protective colloid which is a water soluble, alkali stable, high molecular weight polymer of natural or synthetic origin, together with a hydrotropic agent.

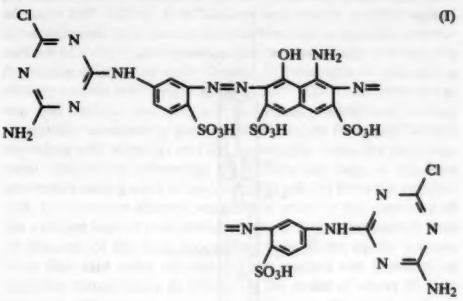
4,351,640

DYE POWDER FORMULATION

Ortwin Schaffer, 43 Bruesseler Ring, and Manfred Herrmann, 23 Parkstrasse, both of 6700 Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 160,929
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928508
Int. Cl.[3] D06P 67/02
U.S. Cl. 8—524 3 Claims

1. A powder formulation of the dye of the formula



which contains, based on (a+b+c),

(a) from 10 to 65% by weight of the dye of the formula I,

(b) from 5 to 25% by weight of sodium chloride, and

(c) from 10 to 85% by weight of a condensate of β-naphthalenesulfonic acid and formaldehyde, or of a sulfomethylation product which is obtained by condensing phenol, formaldehyde and a sulfite or bisulfite, in the presence of sodium hydroxide, in a molar ratio of phenol:formaldehyde:sulfite or bisulfite:sodium hydroxide of 1:1.0–4:0.3–1.6:0.05–0.5.

4,351,641

CONTINUOUS DYEING OF PILE FABRICS

Thomas M. Tymon, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 14, 1980, Ser. No. 149,670
Int. Cl.[3] D06P 1/00, 3/00
U.S. Cl. 8—638 1 Claim

1. A method for producing continuous dyed pile fabric comprising:

(a) passing the pile fabric through a wet out bath comprising a wetting agent and an agent for pH adjustment;

(b) applying, to the entire pile surface of the wetted out pile fabric, using a Kusters dye applicator, an aqueous dye solution comprising at least two dyestuffs, the dyestuffs being selected to have approximately equal strike rates, and a sufficient amount of thickening agent to provide a dye solution viscosity of from about 300 to about 1,000 centipoise (Brookfield Viscometer);

(c) steaming to fix the dyes on the pile fabric; and,

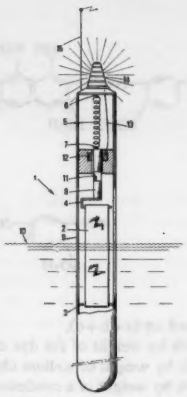
(d) washing the pile fabric to remove chemicals and any unfixed dyes;

wherein the resulting dyed pile fabric exhibits more uniform shade in the across machine direction as compared to the uniformity of shade obtained using a Kusters dye applicator to apply said dye solution at a conventional Kusters applicator viscosity of less than about 100 centipoise (Brookfield Viscometer).

4,351,642
ELEMENTS SENSITIVE TO CERTAIN POLLUTING AGENTS, PARTICULARLY HYDROCARBONS AND METHOD OF USE

Gerard Bonavent, Rueil-Malmaison, and Lucien Montabord, Cormeilles en Parisis, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 28, 1980, Ser. No. 143,979
Claims priority, application France, Apr. 27, 1979, 79 10786
Int. Cl.³ G01N *33/00*; G08B *21/00*; H01H *35/00*
U.S. Cl. 23—230 M **19 Claims**



1. A sensitive element comprising

(a) a component made of a material which is resistant to sunlight but which deteriorates upon contact with an organic pollutant, and

(b) means for generating a countermeasure, said means cooperating with said component and being actuated upon deterioration thereof; wherein said material comprises a sequenced styrene-butadiene copolymer of which at least a part is dehydrogenated.

4,351,643
METHOD FOR CONCENTRATING A LOW-CONCENTRATION ELEMENT IN A SOLUTION

Kuppusami Goviadaraju, Houdemont, France, assignor to Instruments S.A., Paris, France

Filed Jun. 17, 1980, Ser. No. 160,422
Claims priority, application France, Jun. 18, 1979, 79 15571
Int. Cl.³ G01N *31/04, 33/24, 33/18*; G01J *3/30*
U.S. Cl. 23—230 EP **8 Claims**

1. A method for the quantitative analysis of a first element present in low concentration in a first solution wherein said first solution also contains a second element or group of second elements in a concentration higher than the concentration of said first element which comprises:

passing said solution through a column of ion exchange resin for fixing specifically said first element, wherein the diameter of said column is 1 to 3 mm, and the height of said column is 1 to 10 cm, thereby removing said second element or a group of second elements from said first element;

passing a small volume of elution liquid through said column to elute said first element from the ion exchange resin and thereby obtaining a second solution of said first element wherein said first element is present in higher concentration than in said first solution;

supplying all of said second solution to a nebulizer, thereby transforming said second solution into an aerosol;

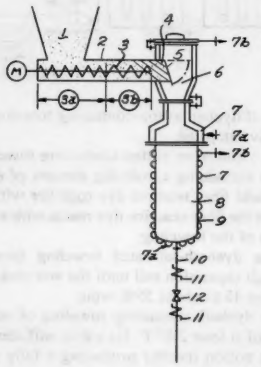
introducing all of said aerosol and thereby introducing all of said first element initially present in said first solution into an inductive plasma; and

analyzing the spectrum emitted whereby all of the said first element intially present in said first solution takes part in the emission of the spectrum.

4,351,644
PROCESS FOR HANDLING LIQUID CYANURIC CHLORIDE

Norbert Kriebitzsch, Hammersbach; Kurt Puschner, Frankfurt, and Klaus Hentschel, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,442
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011860
Int. Cl.³ B01J *8/08*
U.S. Cl. 23—293 R **2 Claims**



1. In a process of supplying and conveying solid cyanuric chloride into a cyanuric chloride melt wherein there is provided a screw conveyor having a first screw portion having a selected helix pitch and a second screw portion having a selected helix pitch that is larger than said selected helix pitch of said first portion, said screw conveyor being disposed in conduit means having one end adjacent a vapor space that is free of screw windings, the process including the steps of supplying the solid cyanuric chloride along said screw conveyor, compacting the cyanuric chloride to form a gastight stopper of cyanuric chloride at said one end of said conduit means while supplying the cyanuric chloride into said vapor space.

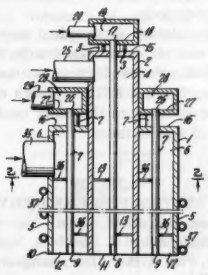
4,351,645
PARTIAL OXIDATION BURNER APPARATUS

Charles P. Marion, Mamaroneck; Albert Brent, Huntington, both of N.Y.; George N. Richter, San Marino, Calif.; William B. Crouch, Chappaqua; Edward T. Child, Tarrytown, both of N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 167,876
Int. Cl.³ C10J *3/50*
U.S. Cl. 48—61 **28 Claims**

1. A burner for the partial oxidation of a reactant fuel feedstream selected from the group consisting of a pumpable slurry of solid carbonaceous fuel in a liquid carrier, liquid or gaseous hydrocarbon fuel, and mixtures thereof with a reactant stream of free-oxygen containing gas, with or without admixture with a temperature moderator comprising: a central conduit, said central conduit being closed at the upstream end and having a downstream circular exit orifice at the tip of the burner; an outer conduit coaxial and concentric with said central conduit

and forming an annular passage therebetween, said outer conduit and annular passage being closed at the upstream end and having an unobstructed downstream annular exit orifice at the tip of the burner and wherein the central longitudinal axis of the annular passage is parallel to the central longitudinal axis of the burner throughout its length; a central bunch of tubes in symmetrical spaced relationship passing through the closed end of said central conduit and making a gastight seal therewith, the tubes of said central bunch of tubes being parallel to each other and to the burner axis and extending along said central conduit without touching each other and having upstream inlet means including a manifold for introducing a first feedstream and downstream ends through which said first feedstream is discharged, and said downstream ends are retracted upstream from the burner face a distance of about 3 to 10 times the minimum diameter of the central conduit exit orifice at the tip of the burner to provide a central pre-mix zone comprising 2 to 5 separate communicating in line coaxial cylindrical shaped central pre-mix chambers in series, means for spacing and supporting said central bunch of tubes with respect to the inside wall of said central conduit and to each other, and upstream inlet means for introducing a second feedstream into said central conduit and the interstices between the central bunch of parallel tubes; an annular bunch of tubes in symmetrical spaced relationship passing through the closed end of said annular passage and making a gastight seal there-



with, the tubes of said annular bunch of tubes being parallel to each other and to the burner axis and extending along said annular passage without touching each other and having upstream inlet means including a manifold for introducing a third feedstream into said tubes and downstream ends through which said third feedstream is discharged, and wherein said downstream ends are retracted upstream from the burner face a distance of about 3 to 10 times the minimum width of the annular exit orifice at the tip of the burner to provide an annular pre-mix zone comprising 2 to 5 separate communicating in line coaxial annular shaped annular pre-mix chambers in series, means for spacing and supporting said annular bunch of tubes with respect to the inside wall of said annular passage and to each other, upstream inlet means for introducing a fourth feedstream into said annular passage and the interstices between the annular bunch of parallel tubes in said annular passage; and a plurality of longitudinal gas conduits parallel to the burner axis and radially spaced between said central conduit and said annular passage, said gas conduits being closed at the downstream end near the burner tip and connected to a gaseous feedstream at the upstream end; and a plurality of feeder lines connecting said gas conduits to said pre-mix chambers in said central conduit and/or in said annular passage for introducing said gaseous feedstream; and wherein ignition of mixtures of the reactant feedstreams takes place downstream from the face of the burner.

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CYCLIC PROCESS FOR PRODUCING METHANE FROM CARBON MONOXIDE WITH HEAT REMOVAL

Albert C. Frost, Congers, and Chang-lee Yang, Spring Valley, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 12, 1980, Ser. No. 158,802
Int. Cl.³ C10K 3/04
U.S. Cl. 48—197 R **4 Claims**

1. In a cyclic, essentially two-step process for the production of methane from carbon monoxide—containing gas streams by (a) disproportionation of the carbon monoxide at a temperature of about 100°–350° C. in a fluidized bed reactor to form carbon monoxide and an active surface carbon that is deposited on the surface of a disproportionation catalyst essentially without the formation of inactive coke thereon, (b) reaction of said active surface carbon with steam at about 100°–400° C. to form methane and carbon dioxide, and (c) passing additional carbon monoxide—containing gas over said catalyst from step (b) and repeating said steps (a) and (b) on a cyclic basis, the improvement comprising removing the exothermic heat of reaction generated during each of said steps (a) and (b) from the catalyst bed, or a portion thereof, essentially prior to the exposure of the catalyst bed, or said portion thereof, to the exothermic heat of reaction of the next succeeding step of the cyclic process such that said steps (a) and (b) are carried out between an initiation temperature as low as on the order of about 230° C. and an upper temperature not exceeding on the order of about 310° C. with the essentially complete removal of all of the heat generated during each complete cycle, with step (a) being carried out in a fluidized bed reactor, with said bed being collapsed to a packed bed during step (b) in which the amount of steam employed is considerably less than the amount of feed gas employed in step (a), and including passing the carbon monoxide containing feed gas stream to the reactor at said initiation temperature as low as on the order of about 230° C. and at a CO concentration of from about 1 percent to about 80 percent by volume, the exothermic heat of reaction generated during the disproportionation step (a) being removed from the reactor through boiler tubes submerged within the reactor without temperature rise within the bed, said boiler tubes serving only partially to remove the exothermic heat of reaction during the subsequent steaming step (b) in which the bed is collapsed and the steaming reaction/heating front moves through the bed faster than the slower moving cooling front, thus raising the temperature of the bed from on the order of about 230° C. to on the order of about 310° C., the sensible heat thus stored in the bed being removed during the next step (a), said submerged boiler tubes being adapted to effectively dissipate said heat upon fluidization of the bed, thus reducing the temperature of the bed from on the order of about 310° C. to on the order of about 230° C. during said disproportionation step (a), thereby avoiding the accumulation of heat over the course of consecutive processing cycles.

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PARTIAL OXIDATION PROCESS

Charles P. Marion, Mamaroneck; Albert Brent, Huntington, both of N.Y.; George N. Richter, San Marino, Calif.; William B. Crouch, Chappaqua; Edward T. Child, Tarrytown, both of N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.

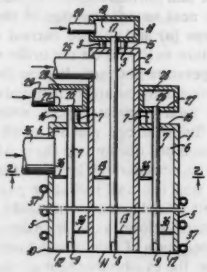
Division of Ser. No. 167,876, Jul. 14, 1980, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979. This application Jun. 10, 1981, Ser. No. 272,418
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R **3 Claims**

1. In a continuous process for the manufacture of gas mixtures comprising H_2, CO, CO_2 and at least one material selected from the group consisting of H_2O, N_2, A, CH_4, H_2S and COS by the partial oxidation of a reactant stream selected from the group consisting of a pumpable slurry of solid carbonaceous fuel in a liquid carrier, liquid or gaseous hydrocarbon

fuel, and mixtures thereof with a reactant stream of free-oxygen containing gas, with or without a temperature moderator selected from the group consisting of steam, liquid water, CO_2, N_2, cooled portion of product gas, and mixtures thereof; said partial oxidation reaction taking place in the reaction zone of a free-flow gas generator at an autogenous temperature in the range of about 1700° to 3500° F. and at a pressure in the range of about 5 to 300 atmospheres, the improvement which comprises;

(1) splitting a portion of one of said reactant streams called the first reactant with or without admixture with a portion of said temperature moderator into a plurality of separate streams by passing said portion of first reactant through a central bunch of evenly spaced parallel tubes in a central conduit of a burner, said central conduit being coaxial with the longitudinal axis of said burner and having an unobstructed downstream circular exit orifice at the tip of the burner;

(2) simultaneously passing through said central conduit in the same direction as the plurality of streams of first reactant, a portion of the other reactant stream called the second reactant with or without admixture with a portion of said temperature moderator, and introducing said portion of second reactant into the interstices between said central bunch of tubes;



(3) splitting the remaining portion of said first reactant stream with or without admixture with a said temperature moderator into a plurality of separate streams by passing said remaining portion of first reactant through an annular bunch of evenly spaced parallel tubes in an annular passage of said burner, said annular passage being concentric with said central conduit and having an unobstructed downstream annular exit orifice at the tip of the burner;

(4) simultaneously passing through said annular passage in the same direction as the plurality of streams of first reactant, the remaining portion of said second reactant with or without admixture with a portion of said temperature moderator, and introducing said portion of second reactant into the interstices between said annular bunch of tubes;

(5) mixing together the reactant streams from (1) and (2) to produce a well-distributed blend; and burning the mixture downstream in said reaction zone; and

(6) simultaneously mixing together the reactant streams from (3) and (4); and burning the mixture downstream in said reaction zone.

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ELECTROSTATIC PRECIPITATOR HAVING DUAL POLARITY IONIZING CELL

Gaylord W. Penney, Pittsburgh, Pa., assignor to United Air Specialists, Inc., Cincinnati, Ohio

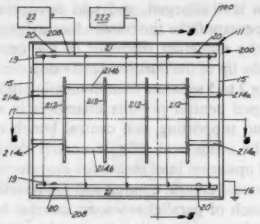
Filed Sep. 24, 1979, Ser. No. 77,891
Int. Cl.³ B03C *3/12, 3/38*
U.S. Cl. 55—137 **4 Claims**

1. A two-stage electrostatic precipitator air cleaner for removing particles from an airstream laden with said particles comprising an ionizer cell for producing a plurality of relatively high electrostatic fields for charging said particles and a collecting cell positioned downstream from said ionizer cell for collecting said particles, said ionizer cell comprising:

a plurality of thin electrically conductive spaced parallel wire-like ionizer electrodes positioned across the inlet to said ionizer cell;

means for charging said ionizer electrodes to a first relatively high DC voltage;

an electrically conducting plate-like passive electrode positioned between and parallel to each adjacent pair of said ionizer electrodes;



means for charging said passive electrodes to a second relatively high DC voltage such that a relatively high electrostatic field is created between said ionizer electrodes and said passive electrode;

and a box-like enclosure surrounding said ionizer cell, the side walls of said enclosure adjacent the outermost ones of said ionizer electrodes forming grounded electrically conducting surfaces, a relatively high electrostatic field being produced between the outer ones of said ionizer electrodes and said surfaces.

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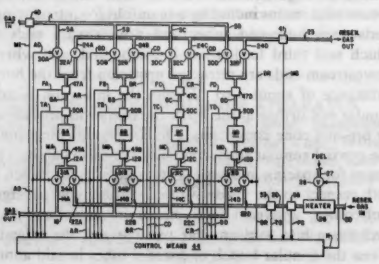
CONTROL SYSTEM FOR GAS DEHYDRATORS

William R. Owens, Ridgefield, Conn.; Henry C. Chan, Port Arthur, Tex.; Ooriapadical C. Abraham, Nederland, Tex., and Levi C. Parker, Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 96,862, Nov. 23, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,135
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—162 **13 Claims**



1. A control system for a plurality of gas dehydrators, each dehydrator having a dessicant bed, comprising

means for sensing the moisture of gas entering and leaving each dehydrator and providing moisture signals representative thereof,

moist gas means connected to each dehydrator for providing moist gas to each dehydrator in accordance with control signals,

dehydrated gas means connected to each dehydrator for

discharging dehydrated gas from the dehydrator in accordance with control signals,

regeneration gas means connected to each dehydrator for providing regeneration gas to each dehydrator in accordance with control signals,

discharge regeneration gas means connected to each dehydrator for discharging regeneration gas from the dehydrator in accordance with control signals,

control signal means connected to the sensing means, to the moist gas means, to the dehydrated gas means, to the regeneration gas means and to the discharge regeneration gas means for providing the control signals to the moist gas means, to the dehydrated gas means, to the regeneration gas means and to the discharge regeneration gas means in accordance with the signals from the sensing means so as to cause each dehydrator to dehydrate moist gas to provide dehydrated gas until the dessicant bed in the dehydrator requires regeneration and to then cause regeneration of the bed by applying the regeneration gas and discharging said regeneration gas after passage through the dehydrator until the bed is regenerated at which time the dehydrator again dehydrates moist gas, and

channeling detection means connected to the moisture sensing means for detecting if channeling has occurred in a bed in accordance with the moisture signals.

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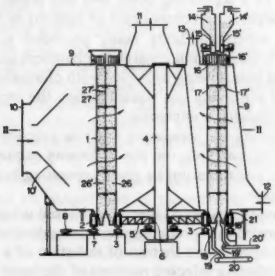
EXHAUST GAS DESULFURIZATION APPARATUS

Naoharu Shinoda; Nobutaka Maeda, and Kyoji Kubo, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 249,924
Int. Cl.³ B01D *53/08*
U.S. Cl. 55—181 **7 Claims**



1. An exhaust gas desulfurization apparatus comprising:

a housing having a plurality of gas inlets and outlets;

a cylindrical cage mounted rotatably about a substantially vertical axis within said housing, said cylindrical cage including a perforated cylindrical outer shell, a concentric perforated inner shell, an imperforate top section, an imperforate bottom section and a concentric perforated shell placed intermediate the inner and outer cylindrical shells and defining, respectively, inner and outer packing sections, said cage further including a plurality of vertically disposed, radially extending sealing partitions defining a plurality of chambers within each of said inner and outer packing sections;

a gas-removing adsorbent placed stationarily with respect to and within the inner packing section;

a particulate separating packing placed stationarily with respect to and within the outer packing section, said particulate separating packing having a smaller particle size than said gas removing adsorbent;

a means for replacing said gas-removing adsorbent;

a means for replacing said particulate separating packing independent of said gas-removing adsorbent;

an inner casing secured within said housing between the vertical axis and the concentric inner shell, said inner casing and corresponding sections of said housing being divided into an adsorption zone, a desorption zone, a cooling zone and a gas-removing adsorbent and particulate separating packing replacement zone,

a first means for sealingly engaging said housing with the perforated cylindrical outer shell; and

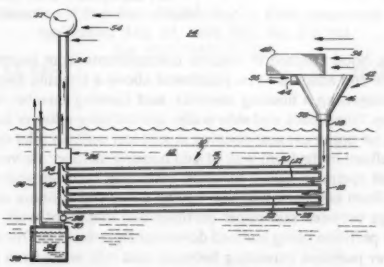
a second means for sealingly engaging said inner casing with the concentric inner shell, said first and second sealing means provided to sealingly separate the inner casing, the corresponding sections of said housing and some of the plurality of chambers into said zones, whereby rotation of said cylindrical cage between each of said zones permits removal of particulate and gaseous contaminants from an exhaust gas introduced into said apparatus through one of said plurality of gas inlets such that the gas passes sequentially through said particulate separating packing contained in the outer packing section and thereafter through the gas-removal adsorbent, desorption of said adsorbent, cooling of said adsorbent and selective replacement of said gas-removal adsorbent and said particulate separating packing.

4,351,651

APPARATUS FOR EXTRACTING POTABLE WATER

Calice G. Courneya, Route 7, Alexandria, Minn. 56308

Filed Dec. 12, 1980, Ser. No. 215,967
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—210 **16 Claims**



1. Apparatus for extraction of potable water from moisture-laden atmospheric air, comprising, in combination: cold heat exchanger in temperature communication with the subsurface media of earth and providing for passage of moisture-laden air therethrough and providing for the extraction of water from such moisture-laden air by passive cooling of the air to or near the dew point of the air causing the water in the air to condense; air entrance means in air communication with the atmosphere and in air communication with the cold heat exchanger for providing moisture-laden air from the atmosphere to the cold heat exchanger; air exit means in air communication with the cold heat exchanger and in air communication with the atmosphere for providing moisture-drained air from the cold heat exchanger to the atmosphere; means for maximizing the amount of water condensed in the cold heat exchanger and for preventing the air flow from exceeding the heat exchanger capacity comprising an air restrictor in the air exit means for restricting the flow of air through the air exit means for increasing the residence time of the air passing through the cold heat exchanger wherein said restrictor restricts the flow of air to a greater degree as the temperature of the exhaust air through the exit means increases and/or restricts the flow of air to a greater degree as the velocity of the exhaust air through the exit means increases; means for causing air flow from the atmosphere, through the cold heat exchanger and back to the atmosphere; and a reservoir in fluid communication

with the cold heat exchanger to collect water condensed out of the moisture-laden air in the cold heat exchanger.

4,351,652

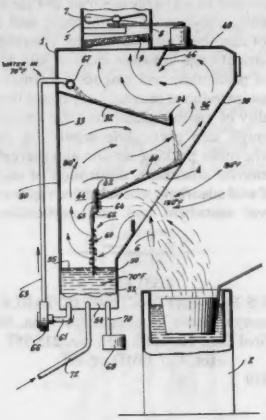
FUME HOOD

Walter L. Wisting, 5 Oakdale Rd., Branford, Conn. 06405

Continuation of Ser. No. 865,793, Dec. 30, 1977, abandoned, which is a continuation of Ser. No. 522,536, Nov. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 243,081

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—229 **4 Claims**



1. A hood adapted to remove contaminants from incoming airflow and adapted to be positioned above a cooking apparatus comprising a housing member, said housing member having top, front, back and side walls, and defining a lower liquid sump, an upper exhaust opening in said top wall, an inlet opening defined in the front wall of said housing member above said defined sump, an upper partition extending between said side walls from said back wall and having a free end defining an air passage between said upper partition and said front wall, said upper partition being inclined downwardly toward its free end, a lower partition extending between said side walls from said front wall and having a free end defining an air passage between said lower partition and said back wall, said lower partition inclined downwardly toward its free end, the free end of said lower partition overhanging said sump, said upper and lower partitions defining an air passage therebetween of decreasing cross-sectional area to said air passage defined by the free end of said upper partition and said front wall whereby a tortuous air passage is defined from said inlet opening about said lower partition, between said partitions, between said upper partition and said front wall and to said exhaust opening, a screen having openings therein extending between said side walls and from the free end of said lower partition into said sump, said screen and said back wall defining an air passage of a lesser cross-sectional area than said air passage between said partitions adjacent said back wall, each of said partitions having means on the free ends thereof defining a liquid dam having a horizontal upper edge, and means for drawing liquid from said sump and delivering the liquid substantially uniformly to the upper surface of said upper partition whereby the liquid will overflow the dam on said upper partition and fall in a sheet to said lower partition and thereafter overflow the dam on the free end of said lower partition, and move across the screen and the openings in said screen to said sump, whereby air passing into said inlet opening and through said housing member passes through the liquid moving across the openings in said screen and then through a sheet of liquid overflowing the dam of said upper partition, and means for moving air through said housing member.

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METHOD FOR PRODUCING SEPARATING NOZZLE ELEMENTS

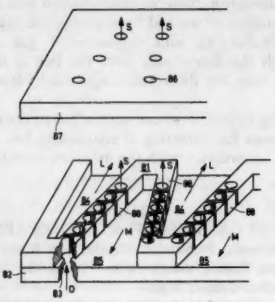
Erwin W. Becker; Wolfgang Ehrfeld; Gunther Krieg, all of Karlsruhe, and Wilhelm Bier, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,569

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933570

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—394 **13 Claims**



1. A method for producing a separating nozzle element composed of a separating body and end plates enclosing the body, for separating components of gaseous or vaporous mixtures, the separating body being provided with separating structures which delimit separating chambers and gas conduits and the end plates being provided with channels for supplying gas to, and removing gas streams from, the separating chambers and conduits, comprising:

(a) producing the separating body in successive contiguous layers by carrying out the following sequence of steps a plurality of times until a given separating body thickness is achieved:

(i) providing a mold layer of a material whose ability to be removed by a predetermined procedure is influenced by that application thereto of radiation of a given type;

(ii) irradiating selected portions of the layer with an effective amount of the given type of radiation in a spatial pattern corresponding to the separating structures to render only selected regions of the layer which correspond to the separating structures removable in the predetermined manner;

(iii) removing the selected regions by performing the predetermined procedure on the irradiated layer; and

(iv) filling the spaces created in the layer by said step of removing with a material which is compatible with the gaseous or vaporous mixture whose components are to be separated, in order to form a laminar portion of the separating structures; and

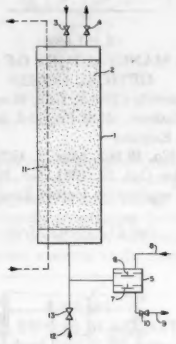
(b) removing the remaining material of the mold layers.

12. A separating nozzle element produced according to the method defined in claim 1 and presenting a plurality of adjacent separating nozzle systems each having at least one separating chamber communicating with an associated inlet conduit and outlet conduit, wherein each said inlet conduit communicates with said chambers of an associated pair of adjacent nozzle systems and each said outlet conduit communicates with said chambers of an associated pair of adjacent nozzle systems.

4,351,654
PROCESS FOR THE REMOVAL OF PRECIPITATES IN HEAT EXCHANGERS OF LOW TEMPERATURE INSTALLATIONS

Waldemar Krebs, and Hermann Bromme, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,222
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950810
Int. Cl.³ F25J *3/00*
U.S. Cl. 62—13 **8 Claims**



1. A process for removing troublesome precipitates of condensable gases in a heat exchanger of a continously operated low temperature installation wherein gas to be cooled which contains condensable gases at a temperature of e.g. from 25° C. to 30° C. is passed from the warm end to the cold end of the exchanger through a storage material and over heat exchange surface, maintained at a temperature ranging from −165° C. to −160° C. at the cold end, and cold regenerator gas free of condensable gases is alternately passed from the cold end to the warm end over the storage material and heat exchanger surfaces to remove precipitates of the condensable gases therefrom in a cyclic operation, without total shut-down of the installation, characterized in that warm gas which is at a temperature of between 0° C. and +110° C. and which does not contain any condensable gases is introduced briefly at the cold end of the heat exchanger and is passed over the heat exchanger surfaces and through the storage material to remove precipitates of the condensable gases.

4,351,655
TWO STAGE CARBON DIOXIDE AND METHANE SEPARATION

Ralph E. Styring, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 108,204, Dec. 28, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,197
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—28 **3 Claims**

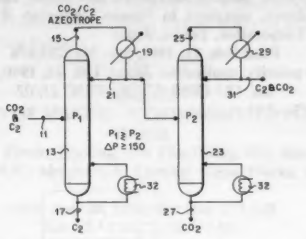
1. A method for separating a mixture of carbon dioxide and ethane derived from a prior separation stage, said method comprising:

(a) passing a fluid mixture comprised of carbon dioxide and ethane into a first distillation column, said fluid mixture having been derived from a prior carbon dioxide separation stage;

(b) operating said first distillation column at a first pressure to form an azeotropic mixture of carbon dioxide and ethane;

(c) passing said azeotropic mixture to a second distillation column;

(d) operating said second distillation column at a second pressure different from said first pressure, said difference between said first pressure and said second pressure being at least 150 psia; and

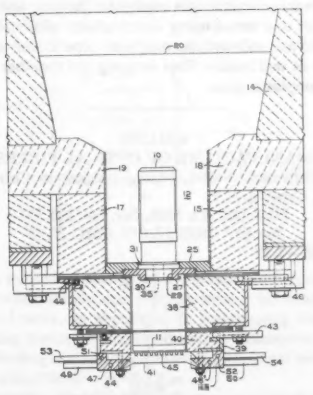


(e) separating and recovering at least a portion of said ethane in said azeotropic mixture passed to said second distillation column.

4,351,656
HIGH PRESSURE FORMING BUSHING

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 193,206, Oct. 2, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,704
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 **22 Claims**

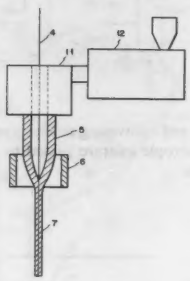


1. A fiber glass forming bushing comprising a container for molten glass having a corrugated bottom forming a plurality of ridges and grooves, said ridges having a generally flat surface and said grooves forming a space between adjacent ridges, each ridge being spaced equidistant from the next adjacent ridge, insulating material filling each of said grooves, orifices positioned on said ridges and projecting therefrom, said orifices being in communication with the interior of said container to thereby permit molten glass to pass from said container through said orifices by gravity and means to connect said bushing to a molten glass source and means external of the bushing and in contact with said insulating material to provide mechanical support to the bottom of the bushing.

4,351,657
METHOD FOR COATING OPTICAL FIBERS WITH THERMOPLASTIC RESIN

Takao Kimura; Shigeki Sakaguchi, and Hisao Takata, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,476
Claims priority, application Japan, Feb. 21, 1980, 55-19843
Int. Cl.³ C03B *37/025;* C03C *25/02*
U.S. Cl. 65—3.11 19 Claims

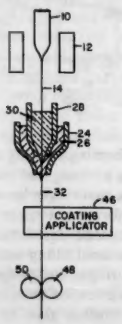


1. A process for preparing optical fibers comprising:
drawing an optical fiber preform, which has been heated and softened, at or above a predetermined speed to form an optical fiber;
continuously extruding thermoplastic resin around said optical fiber to form a continuous thermoplastic pipe having an inner diameter sufficiently large to surround said optical fiber and continuously feeding said extruded thermoplastic pipe along with said optical fiber; and
passing said continuously fed optical fiber and surrounding thermoplastic pipe to a means for heating and softening part of said surrounding thermoplastic pipe to cause said heated and softened thermoplastic pipe to coat said optical fiber as said optical fiber is being fed together with said thermoplastic pipe.

4,351,658
MANUFACTURE OF OPTICAL FIBERS

Robert Olshansky, Natick, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 12, 1980, Ser. No. 215,574
Int. Cl.³ C03B *37/075;* C03C *25/02*
U.S. Cl. 65—3.12 6 Claims

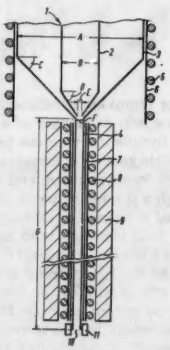


1. A method of forming an optical waveguide fiber comprising the steps of
forming by a chemical vapor deposition technique a glass draw blank comprising a centrally disposed region of core glass surrounded by a thin layer of inner cladding glass,
heating at least a portion of the preform and drawing therefrom a preliminary fiber,
passing said preliminary fiber through a first crucible containing a first outer cladding glass having an expansion coefficient larger than that of said core glass and said inner cladding glass, and
passing the resultant fiber through a second crucible containing a second outer cladding glass having an expansion coefficient lower than that of said first outer cladding glass.

4,351,659
METHOD FOR MANUFACTURE OF GRADED INDEX OPTICAL FIBRES

Keith J. Beales, Ipswich; Clive R. Day, Woodbridge, and George R. Newns, Hintlesham, all of England, assignors to The Post Office, London, England

Division of Ser. No. 19,161, Mar. 9, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,779
Claims priority, application United Kingdom, Mar. 14, 1978, 100161/78
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.13 1 Claim



1. A method of manufacturing a graded index optical fibre in a double crucible comprising an outer body portion holding molten cladding glass, an inner body portion within the outer body portion, holding molten core glass, the inner body portion having an exit orifice leading into the outer body portion, the said body portions being maintained at an elevated temperature characterised by the steps of extending the dwell period in which the core and cladding glasses remain in contact under diffusing conditions with one another in the crucible by providing on the outer body portion downstream of the exit orifice an elongate flow tube, maintaining said flow tube at a temperature above that of the said body portions and lowering the temperature of one region of the elongate flow tube to control the flow rate of molten glass therethrough.

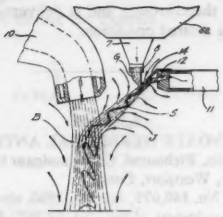
4,351,660
TORATION WITH MULTIPLE JET DEFLECTION

Dominique Plantard, Rantigny; Gerard Langlais, Creil, and Rene Fournier, Rantigny, all of France, assignors to Isover Saint-Gobain, Paris, France

Filed Mar. 16, 1981, Ser. No. 243,709
Claims priority, application France, Feb. 19, 1981, 81 03276
Int. Cl.³ C03B *37/06*
U.S. Cl. 65—5 7 Claims

1. Equipment for making mineral fiber mat comprising a blast generator having a downwardly directed blast orifice, means for generating a plurality of gaseous jets directed in

paths transverse to the path of the blast, a plurality of devices for deflecting each of the jets into paths intercepted by the blast, and a source of molten mineral material with orifice means providing for delivery of streams of the molten material into the deflected jets in zones spaced from the interception of the jets by the blast, the orifice means for delivery of the



streams of molten material being positioned intermediate the blast generator and the means for generating the jets, and the deflected jets having greater kinetic energy than the blast per unit of volume and thereby penetrating the blast and developing zones of interaction in the blast, with resultant fiberization of the streams of molten material in the zones of interaction.

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FIBERIZATION BY GAS BLAST ATTENUATION

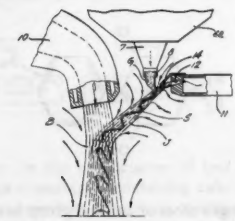
Marcel Levecque, deceased, late of Birchrunville, Pa.; by Marc Levecque, administrator, Paris, France; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Isover Saint-Gobain, Paris, France

Continuation-in-part of Ser. No. 102,256, Dec. 10, 1979, and Ser. No. 90,078, Oct. 31, 1979, Pat. No. 4,268,293, said Ser. No. 102,256, is a division of Ser. No. 926,954, Jul. 20, 1978, Pat. No. 4,199,338, which is a continuation-in-part of Ser. No. 834,540, Sep. 19, 1977, Pat. No. 4,145,203, and Ser. No. 762,789, Jan. 25, 1977, Pat. No. 4,102,662, said Ser. No. 90,078, is a continuation-in-part of Ser. No. 917,480, Jun. 21, 1978, Pat. No. 4,194,897, which is a continuation of Ser. No. 762,789, , said Ser. No. 762,789, is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Mar. 16, 1981, Ser. No. 244,129

Claims priority, application France, Feb. 19, 1981, 81 03276

Int. Cl.³ C03B *37/06*

U.S. Cl. 65—5 **28 Claims**



2. A method for making a fibrous mat of fibers formed from attenuable material, comprising directing a gaseous blast in one path, directing a gaseous jet in first path extended transverse to the path of the blast, deflecting the jet from said first path into a second path extended transverse to path of the blast, said second path being extended toward the blast at a smaller angle to the path of the blast than said first jet path, the deflected jet having a transverse cross-sectional dimension smaller than that of the blast but having kinetic energy per unit of volume greater than that of the blast to provide for penetration of the deflected jet into the blast and thereby develop a zone of interaction of the jet in the blast, the jet flow thereby also merging with the blast flow, delivering a stream of attenuable material in attenuable condition into the influence of the jet, into said zone of interaction thereby effect fiberization of said stream in the blast, and collecting formed fibers on a travelling fiber-collecting surface.

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METHOD OF MAKING PHOTOSENSITIVE POROUS GLASS

Thomas H. Elmer, Corning, and Che-Kuang Wu, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,069

Int. Cl.³ C03C *3/26, 11/00*

U.S. Cl. 65—30.1 **3 Claims**

1. A method of providing a dispersion of a photosensitive silver and chlorine-containing polyphosphate in the pores of a porous glass support with a small average pore diameter which comprises the steps of:

(a) introducing NaCl and KH_2PO_4 into the pores using at least one liquid vehicle;

(b) at least partly removing the liquid vehicle from the pores;

(c) introducing $AgNO_3$ into the NaCl and KH_2PO_4-containing pores using a liquid vehicle; and

(d) heating the glass support to remove remaining liquid vehicle and to react the NaCl, KH_2PO_4 and $AgNO_3$ to form a photosensitive silver and chlorine-containing polyphosphate material in situ in the pores of said support.

4,351,663

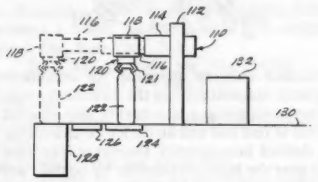
GLASS CONTAINER REJECTOR

Charles L. Wood, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 116,969, Jan. 30, 1980, abandoned. This application Mar. 10, 1981, Ser. No. 242,413

Int. Cl.³ C03B *9/44, 35/12*

U.S. Cl. 65—66 **27 Claims**



1. In an individual section of a machine for forming ware having molded means and cooling means for controllably cooling said ware, an apparatus for transporting ware from said molding means to a selected one of subsequent process means, including said cooling means and a disposal means, said apparatus comprising:

a first member, operable arcuately in a predetermined plane, having first and second actuator means;

a third actuator means for operating said first member arcuately in said predetermined plane;

a second member movable lengthwise with respect to said first member, said first actuator means communicating with said second member and operative to extend and retract said second member with respect to said first member; and

a head member for grasping and releasing said ware, said head member connected to said second member and responsive to said second actuator means for maintaining the axis of said ware perpendicular to a horizontal plane.

25. A method for selectively transferring articles, supplied in successive cycles of operation of a machine, to a first area for

additional processing and a second area for disposal comprising the steps of:

continuously accumulating the number of disposed operations commanded;

grasping said article;

rotating said article, said article being rotated one hundred eighty degrees through a first vertical arc to said first area when the result of said accumulating step is zero and being rotated one hundred eighty degrees through a second vertical arc to said second area when the result of said accumulating step is non-zero;

releasing said article; and

adjusting the result of said accumulating step to account for each executed disposal operation.

4,351,664

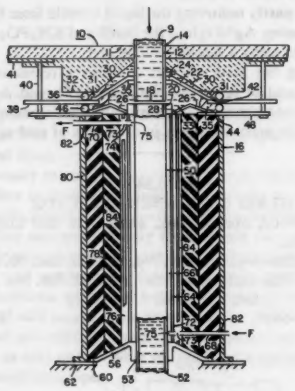
FURNACE DELIVERY SYSTEM

Bihari Bansal, Harrodsburg, Ky., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,024

Int. Cl.³ C03B 7/06

U.S. Cl. 65—128 **17 Claims**



1. A furnace delivery apparatus for conditioning molten thermo-plastic material leaving the furnace at a relatively high temperature comprising: a pipe having inlet adapted to receive the material at one end and an outlet for delivering said material at a desired homogeneity therefrom, the pipe becoming heated to near the high temperature by contact with the thermoplastic material; a shell having at least one fluid inlet and an outlet, the shell located concentrically about said pipe and defining a closed annular space thereabout for receiving a heat exchange fluid and a purge fluid therein, the purge fluid being inert relative to the pipe, said shell having inlets and outlets for at least one pass circulation of the heat exchange fluid and the purge fluid in at least a portion of the annular space adjacent the pipe for respectively removing sensible heat from the material passing through said pipe and for driving out deleterious ambient atmosphere from the annular space, and thereby shielding the pipe while near the relatively high heat from the deleterious ambient; and an insulating structure located about said annular space for minimizing heat loss therefrom.

16. A method of delivering molten thermoplastic material, leaving a furnace at a relatively high temperature through a channel member having an insulating layer spaced exteriorly of the channel member leaving an annular space thereabout, comprising the steps of: conducting said thermoplastic material through the channel member, which channel member becomes heated to near the high temperature by the thermoplastic material in contact therewith; shielding said channel member, while at the elevated temperature, from deleterious ambient atmosphere by supplying a purge fluid into the annular space to be in contact with an exterior of the channel member, and thereby blocking ambient atmosphere from coming into contact with the channel member while it is near the high temperature; choosing the purge fluid to be inert relative to the channel member; and removing heat from said thermo-plastic material by heat exchange with the channel member to a working fluid into and out of portions of said annular space, whereby the thermo-plastic material entering the channel member passes therethrough and is delivered from an outlet end thereof in a desired condition.

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SULFINOATE HERBICIDAL ANTIDOTES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 140,079, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,389, Jun. 27, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,901

Int. Cl.³ A01N 41/00, 33/02

U.S. Cl. 71—103 **5 Claims**

1. A herbicidal composition consisting essentially of

(a) a herbicidally effective amount of trifluralin; and

(b) a non-phytotoxic antidotally effective amount of a sulfinoate of the formula:

in which R and R_1 are each haloalkyl having 1–4 carbon atoms.

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ENOL DERIVATIVES OF 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUND AS SUGAR ENHANCER FOR PLANTS

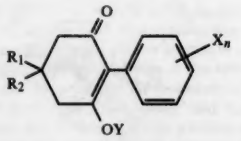
John F. Koerwer, Perkasie, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1980, Ser. No. 163,632

Int. Cl.³ A01N 37/02, 37/06, 31/06, 35/06

U.S. Cl. 71—106 **10 Claims**

1. A method for increasing the sugar content of plants which comprises applying to such plants prior to harvesting an effective amount of a compound of the formula:



wherein:

R_1 is a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms,

R_2 is a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, or a cycloalkyl group having from 5 to 10 carbon atoms.

Y is a hydrogen atom, an alkanoyl, alkynol, aryoyl or alkenoyl group having from 6 to 12 carbon atoms or a cation selected from the group consisting of ammonium radicals, alkaline metal cations and alkaline earth metal cations.

X is an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, a halogen atom, a nitro group, an amino group, or a cyano group.

n is an integer of 1 to 3.

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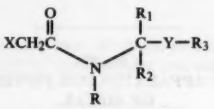
HERBICIDAL TERTIARY 2-HALOACETAMIDES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 897,472, Apr. 18, 1978, abandoned. This application Apr. 18, 1979, Ser. No. 31,087
Int. Cl.³ A01N *37/18;* C07C *103/37, 121/48*
U.S. Cl. 71—118 45 Claims

1. Compounds having the formula



wherein

X is chlorine, bromine or iodine;

Y is O, S or —NH—;

R is a C_{5-7} 1-cycloalken-1-yl radical which may be substituted with C_{1-6} alkyl;

R_1 and R_2 are hydrogen or C_{1-6} alkyl and

R_3 is C_{1-6} alkyl, haloalkyl or alkoxyalkyl or alkenyl, haloalkenyl or alkynyl having up to 4 carbon atoms, cyclopropylmethyl, acetyl when Y is —NH— or pivaloyl or 2-cyanopropyl when Y is O.

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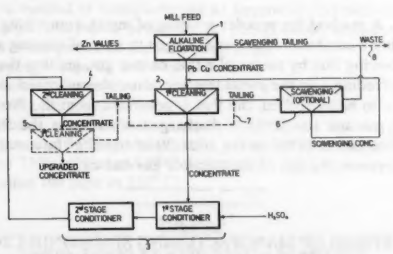
FLOTATION OF CU AND PB SULFIDE CONCENTRATES CONTAINING CARBONATES

Leonard P. Stephenson, Yellowknife, Canada, and Arthur A. Schweizer, Salem, Mo., assignors to Cominco Ltd., Canada

Filed Mar. 9, 1981, Ser. No. 241,960
Int. Cl.³ C22B *1/00;* B03D *1/14*
U.S. Cl. 75—2 9 Claims



1. A process for the beneficiation of lead or copper-lead sulphide ore or concentrate containing calcium and magnesium carbonate impurities comprising conditioning the ore or concentrate in two stages, for a residence time in the conditioning of at least about 15 minutes, with a limited amount of sulphuric acid to form an acidic slurry, said limited amount of sulphuric acid being sufficient to provide a pH in the first stage in the range of about 1.5 to 3.0 without the evolution of hydrogen sulphide, and subjecting said acidic slurry to froth flotation at a pH in the range of about 5 to 6.5 in the presence of a xanthate collector for sulphide minerals for a flotation product of concentrate comprising lead or lead-copper enriched concentrate and a residual slurry of tailing comprising calcium and magnesium as magnesium sulphate, calcium sulphate, and precipitated calcium sulphate.

4,351,669

IMPREGNATING COMPOSITION, A PROCESS FOR ITS PREPARATION AND PRODUCTS PREPARED BY USING THE COMPOSITION

Hilmar R. Nielsen, Forvägen 7, S 145 51 Norsborg, Sweden

Filed Aug. 12, 1980, Ser. No. 177,474
Claims priority, application Sweden, Aug. 16, 1979, 7906866
Int. Cl.³ C09D *5/20*
U.S. Cl. 106—2 15 Claims

1. An impregnating composition suitable for use in imparting fire, water and freezing resistance to cellulose-based materials comprised of the following components:

(a) an alkaline extract formed by contacting an alkali with a lignocellulose material;

(b) a high molecular weight carbohydrate; and

(c) an alkali or alkaline earth metal silicate or colloidal silica.

4,351,670

LIGHTWEIGHT CONCRETE AND METHOD OF MAKING SAME

Harold E. Grice, 120 Abbott St., Salinas, Calif. 93901

Filed Apr. 4, 1980, Ser. No. 137,340
Int. Cl.³ C04B *21/08*
U.S. Cl. 106—88 15 Claims

1. A method of making lightweight, substantially non-shrinking concrete comprising the steps of:

(a) providing a body of cured cellular concrete material, said cellular concrete material being of a type whose curing is accompanied by substantial shrinkage;

(b) breaking said body of cured cellular concrete material into fragments;

(c) coating said fragments with a first cementitious material and allowing said cementitious material to cure; and

(d) mixing said fragments, thus coated, with a second cementitious material for ultimate curing as a finished product, said second cementitious material being of a type whose curing is accompanied by minimal shrinkage.

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WATER REDUCING AGENT WITH REDUCED AIR

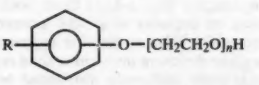
Arnold M. Rosenberg, Potomac; James M. Gaidis, Ellicott City, and Lawrence J. Kindt, Woodbine, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,235
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—90 8 Claims

1. An additive composition for hydraulic cement consisting essentially of

(a) a lignin-water-reducing agent and

(b) 2 to 8 weight %, based on the lignin water-reducing agent, of



in which R is octyl or nonyl and n is 10 to 18.

4,351,672

REMOVAL OF OBJECTIONABLE FLAVOR AND ODOR CHARACTERISTICS IN FINISHED SUGAR PRODUCTS PRODUCED FROM MOLASSES

Otto G. Hohnerlein, Jr., Savannah; Willie E. Smith, Jr., Tybee Island, and Nicholas T. Rimedio, Sr., Savannah, all of Ga., assignors to Savannah Foods & Industries, Inc., Savannah, Ga.

Filed Nov. 10, 1980, Ser. No. 205,515
Int. Cl.³ C13D *3/14*
U.S. Cl. 127—46.3 15 Claims

1. A method for removing undesirable flavor and odor char-

acteristics in a finished sugar product produced from the ion exclusion of molasses which yields sugar and non-sugar portions and wherein the sugar portion is treated according to the steps comprising:

(a) subjecting the sugar portion of ion excluded molasses to gross decolorization;

(b) purifying the solution treated according to step (a) to remove all remaining impurities; and

(c) concentrating or evaporating the purified sugar portion so that the percent of dry solids in solution is substantially increased to obtain a high quality sugar product which conforms to or exceeds existing standards for such sugar products, the method being further characterized by subjecting the sugar portion prior to concentrating or evaporating to the steps comprising:

(i) treating the sugar portion with a halogen or a nascent halogen agent so that the sugar portion is acidified to a point lower than its naturally occurring pH;

(ii) removing excess free halogen from the sugar portion treated according to step (i) to render the sugar portion free from objectionable flavor and odor characteristics.

4,351,673
METHOD FOR REMOVING IRON SULFIDE SCALE FROM METAL SURFACES

Michael B. Lawson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 22, 1981, Ser. No. 266,226
Int. Cl.³ C23G *1/08*
U.S. Cl. 134—3 **10 Claims**

1. A process for dissolving ferrous sulfide with minimum evolution of hydrogen sulfide gas comprising contacting said ferrous sulfide with an aqueous acidic solution containing a compound in an amount effective to dissolve ferrous sulfide, said compound selected from the group consisting of maleic acid, maleic anhydride, alkali metal and ammonium salts of maleic acid and mixtures thereof, said aqueous solution having a pH of less than 7, and maintaining said contact for a time and at a temperature sufficient to dissolve said ferrous sulfide.

4,351,674
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Isao Yoshida, Tokyo, Japan; Yasuo Wada, Waban, Mass.; Masao Tamura, Tokorozawa, Japan; Masanobu Miyao, Kodaira, Japan; Makoto Ohkura, Hachioji, Japan; Nobuyoshi Natsuaki, Kodaira, Japan, and Takashi Tokuyama, Higashikurume, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1980, Ser. No. 182,825
Claims priority, application Japan, Aug. 29, 1979, 54-109165
Int. Cl.³ H01L *21/265, 21/263*
U.S. Cl. 148—1.5 **11 Claims**

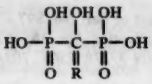
1. A method of producing a semiconductor device including the step of irradiating with a laser beam both a first region which contains an impurity at a high concentration and a second region which adjoins the first region to diffuse said impurity in a plane direction into said second region, whereby the impurity is more uniformly distributed in the first and second regions to provide a more uniform impurity concentration in the first and second regions.

4,351,675
CONVERSION COATINGS FOR ZINC AND CADMIUM SURFACES

Donald J. Guhde, Euclid, Ohio, assignor to ROHCO, Inc., Cleveland, Ohio

Filed Mar. 2, 1981, Ser. No. 239,331
Int. Cl.³ C23F *7/08*
U.S. Cl. 148—6.15 R **34 Claims**

1. An aqueous acidic coating solution for treating zinc, zinc alloy or cadmium surface consisting essentially of water, an effective amount of nitric acid to provide a desired level acidity, and (A) an oxidizing agent selected from the group consisting of hydrogen peroxide, nitrate ion, nitrite ion, halate ion or mixtures thereof, and (B) a compound having the formula

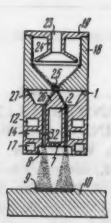


wherein R is hydrogen or an alkyl group of from 1 to 4 carbon atoms.

4,351,676
METHOD AND APPARATUS FOR POWDER SCARFING OF METAL

Artur L. Daiker, ulitsa B.Khmelnitskogo, 27, kv. 14; Anatoly I. Veis, ulitsa Vorovskogo, 9, kv. 77; Evgeny Y. Kochengin, ulitsa Chasovaya, 5, kv. 2; Nikolai M. Novoselov, ulitsa Degtyareva, 89, kv. 58; Gennady Y. Morozov, ulitsa Kommunisticheskaya, 6a, kv. 67; Vladimir S. Rybin, ulitsa Elkina, 84, kv. 29; Nikolai A. Belokur, ulitsa Degtyareva, 40a, kv. 16, and Nina A. Savelieva, prospekt Lenina, 71, kv. 141, all of Chelyabinsk, U.S.S.R.

PCT No. PCT/SU79/00113, § 371 Date Jul. 10, 1981, § 102(e) Date Jul. 10, 1981, PCT Pub. No. WO81/01381, PCT Pub. Date May 28, 1981
PCT Filed Nov. 15, 1979, Ser. No. 285,111
Int. Cl.³ B23K *7/06, 7/08*
U.S. Cl. 148—9 C **3 Claims**



1. A method for powder scarfing of metal, comprising supplying a combustible gas and oxygen to a metal treating zone, delivering flux by means of a flux-carrier gas, melting the flux and feeding it to the metal treating zone, characterized in that prior to being melted, the flux is generated from the flux-carrier gas and the latter is discharged whereupon the flux is melted and then fed to the zone (9) of treating the metal (10) in-between the jets of combustible gas and oxygen.

4,351,677
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING ALUMINUM DIFFUSED SEMICONDUCTOR SUBSTRATE

Yasuhiro Mochizuki; Yoko Wakui, and Hiroaki Hachino, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

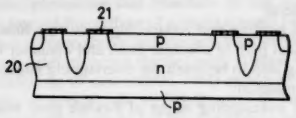
Filed Jul. 10, 1980, Ser. No. 167,399
Claims priority, application Japan, Jul. 16, 1979, 54-89339
Int. Cl.³ H01L *21/225*
U.S. Cl. 148—188 **6 Claims**

1. A method of selectively diffusing aluminum into a silicon semiconductor substrate comprising the steps of:

(a) selectively forming a layer of silicon dioxide to provide a mask pattern having at least one opening therein over a major surface of a silicon semiconductor substrate having an N-conductivity type,

(b) depositing aluminum onto said major surface of said silicon semiconductor substrate so that said aluminum is spaced apart from said layer of silicon dioxide, and

(c) subjecting said substrate to a heat treatment for selectively diffusing said aluminum into selected regions of said silicon semiconductor substrate; said aluminum being



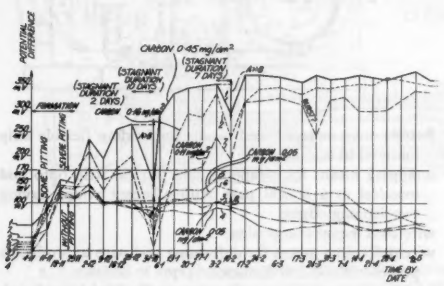
spaced from said layer of silicon dioxide sufficiently to avoid diffusion of the aluminum into said silicon dioxide layer.

4,351,678

METHOD OF MAKING CORROSION RESISTANT PHOSPHOROUS COPPER OR PHOSPHOROUS COPPER ALLOY PIPES

Yves Andrien, Embourg, and Christian Triquet, Esneux, both of Belgium, assignors to Usines a Cuivre et a Zinc de Liege, Belgium

Filed Aug. 6, 1980, Ser. No. 175,749
Int. Cl.³ C23F *7/02*
U.S. Cl. 148—6.31 **3 Claims**



1. A method of manufacturing an improved corrosion resistant pipe comprised primarily of phosphorous copper, the method comprised of the following steps;

forming a pipe by a drawing method;

removing the residue lubricants with a solvent;

heating the pipe to 700° C.;

injecting an atmosphere comprised of 15% by volume oxygen, and 85% by volume of a gaseous mixture comprised of 25% helium and 75% argon; and

heating the pipe to 650° C.

4,351,679

LABEL-LEAFLET APPLYING APPARATUS

Hans C. Dreber, Dallas, Pa., assignor to Culbro Corporation, New York, N.Y.

Filed Aug. 8, 1980, Ser. No. 176,590
Int. Cl.³ B65C *9/08*
U.S. Cl. 156—70 **31 Claims**

1. A high speed apparatus for applying labels to containers in a continuous through put operation, the apparatus having container entry and exit stations and a label applicator station, comprising:

conveyor means for transporting said containers through the apparatus from said entry station to said exit station at a constant predetermined speed and in a predetermined spaced relationship with one another;

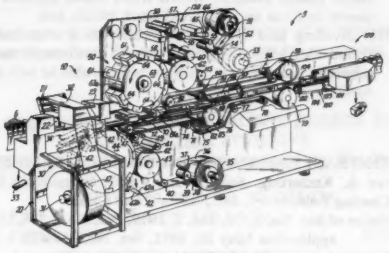
means for feeding a continuous label web to said label application station, said label web having label indicia and particularly oriented verification marks disposed therein for each individual label;

means disposed upstream of said label application station for cutting each individual label from the label web;

means for conveying said cut individual labels to said application station;

label applicator means disposed at said label application station for receiving a cut label and applying said label to a container while the container is in motion as it passes said label application station;

control means for selectively operating said label applicator means at the precise time one of said spaced apart containers passes said label applicator means;



label verification means disposed upstream of said label application station including splice sensing means for detecting portions of the label web which have been spliced together;

tracking means responsive to said splice sensing means for tracking the spliced label web portion and the container to which it is applied; and

means responsive to said tracking means for segregating said container to which a spliced label web portion has been applied from properly labeled containers.

4,351,680

TECHNIQUE FOR CONVERTING BALSA LOGS INTO CONTOURABLE PANELS

Jean Kohn, New York, N.Y., assignor to Baltek Corporation, Northvale, N.J.

Continuation-in-part of Ser. No. 894,047, Apr. 6, 1978, Pat. No. 4,208,369, which is a continuation-in-part of Ser. No. 860,617, Dec. 14, 1977, Pat. No. 4,122,878. This application Aug. 3, 1978, Ser. No. 930,740
Int. Cl.³ B27K *3/15;* B32B *5/18;* B27D *1/00*
U.S. Cl. 156—79 **5 Claims**

1. A technique for producing contourable panels composed primarily of balsa wood and conformable to curved surfaces for lamination thereto comprising the steps of:

(A) cutting balsa trees whose trunk or branch diameters are in a range of about 1½ to 4 inches into raw logs having a length of at least about 6 feet;

(B) peeling the bark from the raw logs to expose the underlying wood;

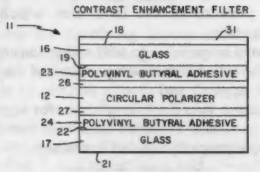
(C) cutting the peeled logs into round balsa wood pieces of like length;
(D) kiln-drying the pieces to reduce the moisture content to about 12 percent;
(E) applying separators to the pieces to keep the pieces from touching each other;
(F) stacking the pieces to form a multi-layer assembly thereof in which the pieces lie in substantially parallel relation and are separated from each other to define a matrix of interstitial spaces;
(G) interlaminating the separated pieces in the assembly by injecting into the matrix a solution of an elastomeric synthetic plastic material which when cured adheres to the pieces to form an integrated stock block; and
(H) dividing said block into panels, each constituted by round tiles hinged together by said elastomeric material, whereby the resultant panel is contourable to said curved surface.

4,351,681

CONTRAST ENHANCEMENT FILTER AND METHOD

Marc A. Kamerling, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Division of Ser. No. 1,359, Jan. 5, 1979, Pat. No. 4,278,736. This application May 18, 1981, Ser. No. 264,475
Int. Cl.³ B32B *31/18*; G02B *1/08*
U.S. Cl. 156—99 **8 Claims**



1. In a method for manufacturing a contrast enhancement filter, providing a circular polarizer having outer surfaces formed of cellulose acetate butyrate, placing a thin film of an optically clear primer on the outer surfaces of the cellulose acetate butyrate of the circular polarizer, drying the thin film of primer, providing first and second glass substrates, providing polyvinyl butyral adhesive layers, assembling the glass substrates, the circular polarizer and the polyvinyl butyral adhesive layers into a sandwich construction by placing the circular polarizer with the primer layers thereon between the glass substrates and placing the polyvinyl butyral adhesive layers between the circular polarizer and the glass substrates, temporarily bonding the sandwich into a unitary assembly, evacuating the air between the layers of the sandwich, subjecting the sandwich to an elevated temperature and pressure to a cause any remaining air within the sandwich to be absorbed by the polyvinyl butyral adhesive layers and to cause the polyvinyl butyral adhesive layers to form a hot melt adhesive to bond the parts of the sandwich into a unitary assembly, cooling the unitary assembly so that the polyvinyl butyral adhesive becomes a solid and reducing the pressure to atmospheric.

4,351,682

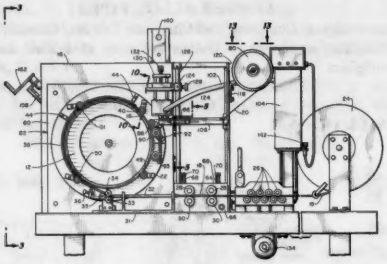
FLEXIBLE DUCT FORMING APPARATUS AND METHOD

Hugh K. McGuire, North Hollywood, Calif., assignor to CASCO Inc., San Fernando, Calif.

Filed Jun. 20, 1980, Ser. No. 161,425
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—143 **78 Claims**

1. A method of producing flexible duct comprising;
feeding flexible strip material to a mandrel;
rotating said mandrel;
wrapping said flexible strip material on said rotating mandrel in a continuous helix, with each successive wrap having overlapping edges;
feeding reinforcing wire to said mandrel;
deforming said reinforcing wire to produce a predetermined coil diameter;
guiding and holding said reinforcing wire on a substantially fixed helical path of constant pitch and diameter from the deforming step to between the overlapping edges of flexible strip material;
sealing said overlapping edges of flexible strip material to each other to encapsulate said wire thereby continuously forming flexible duct.

7. A flexible duct forming apparatus comprising;
a base;
a mandrel;
support means on said base for rotatably supporting said mandrel;
drive means for rotatably driving said mandrel;



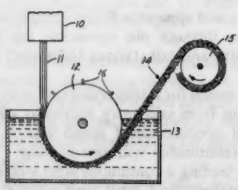
flexible strip material feed means for feeding flexible strip material to said mandrel;
wrapping means for wrapping said flexible strip onto said mandrel in a helical path with adjacent wraps having overlapping edges;
wire feed means comprising;
wire deforming means for deforming said wire to produce a predetermined coil diameter,
wire guide means forming a substantially fixed helical path of constant pitch and diameter for guiding and holding said wire on said substantially fixed helical path from said wire deforming means to between the overlapping edges of said flexible strip material,
sealing means for sealing the overlapping edges of said flexible strip material to encapsulate said wire whereby flexible wire reinforced duct is continuously formed on said mandrel.

4,351,683

METHOD OF FORMING WEB MATERIAL

LeRoy I. Kusilek, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 676,497, Oct. 19, 1967, abandoned. This application Oct. 23, 1970, Ser. No. 83,450
Int. Cl.³ D04B *3/16*
U.S. Cl. 156—167 **4 Claims**



1. Method of making a smooth-surfaced open porous inte-

grated mat of continuous crinkled filaments by continuous differential quenching, which comprises extruding a hot filament-forming extrudable thermoplastic polymeric material in the form of a bundle of closely-spaced separate continuous filaments, permitting said filaments to fall under their own weight toward the surface of a liquid quench bath, maintaining a contact surface above said quench bath surface in a position to permit brief glancing contact with at least a portion of the outer filaments of said bundle while permitting the remaining filaments of said bundle to fall directly to said bath surface, allowing the filaments to fall into the quench bath, and advancing the resulting bundle of filaments within said quench bath at a linear speed substantially less than the extrusion speed of said filaments, whereby to cause crinkling and inter-engagement of said filaments into a lightly unified mat having a flat surface area of increased density.

4,351,684
PNEUMATICALLY OPERATED APPLICATOR AND METHOD OF APPLYING ADHESIVE TAPE

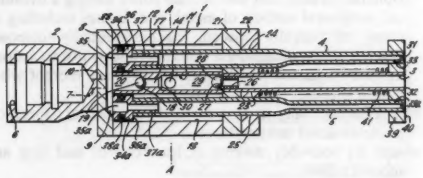
Ralph D. Gibbons, and Geoffrey G. Shackleford, both of Basingstoke, England, assignors to Lansing Bagnall Limited, Hampshire, England

Filed Apr. 27, 1981, Ser. No. 257,612

Claims priority, application United Kingdom, Apr. 29, 1980, 8014054

Int. Cl.³ B29C *17/04, 27/22*

U.S. Cl. 156—215 **11 Claims**



1. A method of applying a length of adhesive tape around a cable, bundle of wires or other generally cylindrical object, comprising:

holding a length of the tape at the end of a tube by pneumatic suction;

moving the said end of the tube to a position adjacent the object;

advancing two probes, one on each side of and relative to the said tube so as to straddle the object; and providing a pneumatic jet laterally inwardly from at least one of the probes to blow a respective part of the tape around the object.

4,351,685
DUPLICATING STENCIL

Leslie Clark, Newcastle upon Tyne, England, assignor to Roneo Alcatel Limited, Romford, England

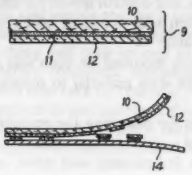
Continuation of Ser. No. 929,467, Jul. 31, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,513

Claims priority, application United Kingdom, Aug. 1, 1977, 32243/77

Int. Cl.³ B32B *31/00;* **D21F** *11/00;* **B41L** *11/06;* **B05D** *5/06*

U.S. Cl. 156—234 **8 Claims**

1. A method of producing a duplicating stencil comprising forming a stencil sheet by detachably bonding an ink impermeable surface layer to a porous base layer by means of an adhesive, said ink impermeable layer having been rendered readily breakable by incorporation of the finely-divided particulate material dispersed therein, placing the ink impermeable surface layer in contact with an electrostatically-produced image on a substrate, passing the contacting stencil sheet, surface layer and substrate image through a fusing stage of heating the image such that the image, in addition to being bonded to the substrate, is bonded to said surface layer and subsequently separating the stencil sheet from the substrate so as to remove the surface layer from the stencil sheet in the image regions.



4,351,686
METHOD OF BONDING SILICONE RUBBER TO NON-SILICONE ADHESIVE

David F. Clark, Burlington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 10, 1980, Ser. No. 215,133

Int. Cl.³ C09J *3/02*

U.S. Cl. 156—329 **8 Claims**

1. A method of bonding a silicone rubber to a non-silicone pressure sensitive adhesive comprising the steps of treating the surface of the silicone rubber to be bonded with a silicone adhesive, and thereafter applying a layer of the non-silicone pressure sensitive adhesive to the treated silicone rubber surface so as to obtain an immediate bond between said layer and said surface.

4,351,687
MACHINE FOR COILING STRIP MATERIAL WITH A DEVICE FOR MOMENTARY IMMOBILIZATION OF THE TAILS OF THE STRIPS

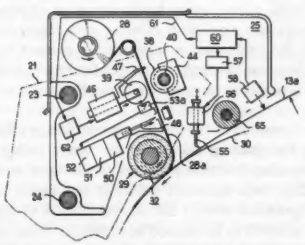
Gaston Lesage, Cannettecourt BP 112, 60600 Clermont, France

Filed Apr. 16, 1981, Ser. No. 254,878

Claims priority, application France, Apr. 16, 1980, 80 08570

Int. Cl.³ B65B *61/00*

U.S. Cl. 156—353 **10 Claims**



1. In a machine for coiling strip material, in which several strips are coiled side by side, on a rotating shaft, a device for momentary immobilization of the strip tails, comprising:

a plurality of supports, each for carrying a roll of adhesive tape;

a pressing roller for pressing tape onto the coil of strip material;

drive and guide means connected to each said support for causing the tape to be driven and guided to said pressing roller, when in an operative position, and for releasing the tape when in a non-operative position;

cutting means mounted on each said support for automatically cutting the adhesive tape after a predetermined length of tape has been fed by said drive and guide means, each of said cutting means comprising a jack fixedly con-

nected to said support, a cutting tool mounted on the piston of said jack, a counting unit for assigning a numerical value to the length of tape being fed by said drive and guide means, and control means for causing said jack to be actuated when said counting unit reaches a preselected numerical value;

separating means mounted on each said support for causing the tail of the strip material to separate from the wound coil;

detector means for detecting the proximity of a tail of strip material; and

control means for causing said drive and guide means to assume said operative position upon detection of a tail by said detector means.

4,351,688

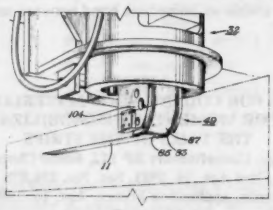
COMPOSITE TAPE LAYING MACHINE

Olin E. Weiss, Anneta North; Grant L. Davis, Fort Worth; James L. Hudson, Azle, and Harlan T. Dowell, Fort Worth, all of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Division of Ser. No. 101,524, Dec. 10, 1979, Pat. No. 4,292,108. This application May 20, 1981, Ser. No. 265,373

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—358 **2 Claims**



1. In an apparatus for laying composite tape in parallel rows to form a structural member, the apparatus being of the type having a table, a tape laying head supported adjacent the table, drive means for providing relative movement between the head and the table, and a tape supply carried by the head, having a free end adapted to pass in a feed path in the head and out onto a work surface on the table, the improvement comprising:

a chute mounted to the head at the discharge end of the feed path for guiding the tape, the chute being curved to change the direction of travel of the tape; and

an endless belt mounted adjacent the chute in a curved configuration around the curved portion of the chute, the tape adapted to be carried between the chute and the belt.

2. In an apparatus for laying composite tape in parallel rows to form a structural member, the apparatus having a table, a tape laying head supported adjacent the table, drive means for providing relative movement between the head and the table, a tape supply carried by the head with a free end adapted to pass through a feed path in the head and out a discharge end onto a work surface on the table, and transverse cutter means for making a severance in the tape, the improvement comprising:

a plurality of rollers carried by the head at the discharge end in a transverse row for pressing the tape onto the work surface; and

roller actuating means for moving the rollers into and from pressing engagement during said relative movement and for retracting the rollers individually from pressing engagement once a roller approaches the severance.

4,351,689

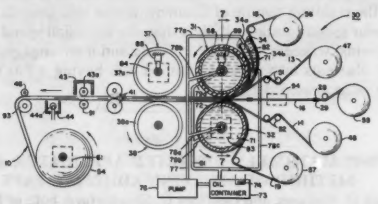
APPARATUS FOR THE MANUFACTURE OF MULTI-CONDUCTOR FLAT CABLE

William A. Elliott, Reynoldsburg, and Thomas J. Taylor, Gahanna, both of Ohio, assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 106,599, Dec. 26, 1979, Pat. No. 4,310,365. This application Aug. 31, 1981, Ser. No. 298,218

Int. Cl.³ B32B *31/08, 31/18, 31/20, 31/26*

U.S. Cl. 156—378 **16 Claims**



1. An apparatus for the manufacture of multi-conductor flat cable comprising:

first and second rotatably mounted laminating rollers positioned to define a nip, and being adjustably biased so as to provide controllable laminating pressure therebetween, said first roller having a smooth, resilient cylindrical peripheral surface, and said second roller having a cylindrical peripheral surface of metal, and further including an array of laterally spaced, circumferentially disposed grooves of predetermined thickness and width to accommodate respective conductors of one array thereof when drawn through the nip of said rollers;

means for internally heating said first and second rollers to a predetermined temperature;

means for rotatably driving at least one of said first and second rollers;

means positioned between the first roller and a first insulative film, when the latter is advanced through a region immediately adjacent the nip of said first and second rollers, for heating an arcuate portion of said resilient peripheral surface of said first roller to a predetermined temperature, and for heating a surface of a short length of such advanced first insulative film to a predetermined temperature;

first and second payoff supply means for allowing the respective advancement of first and second arrays of conductors through the nip of said first and second laminating rollers;

first and second conductor guiding and tensioning means positioned on the upstream side of said first and second rollers for precisely controlling the alignment of the conductors in said first and second arrays when being advanced to the nip of said first and second rollers;

second and third payoff supply means for allowing the respective advancement of first and second adhesive-backed insulative films through the nip of said first and second rollers while said first and second films are respectively positioned to overlie said first and second conductor arrays, respectively;

third payoff means for allowing the advancement of a third insulative film through the nip of said first and second rollers while interposed between said first and second arrays of conductors, and

take-up means for receiving a cable after having been fabricated upon passing through the nip of said first and second rollers.

7. An apparatus in accordance with claim 1, further including:

third and fourth rotatably mounted finishing rollers positioned downstream from said first and second rollers, and positioned to define a nip, and being adjustably biased so

as to provide controllable pressure therebetween, said third and fourth rollers both being unheated and having smooth, resilient, peripheral surfaces, and

means for rotatably driving at least one of said third and fourth rollers.

10. An apparatus in accordance with claim 7, further comprising:

counter means positioned downstream of said third and fourth rollers, for providing an indication of the lineal running feet of a laminated cable when advanced thereby;

printer means positioned downstream of said third and fourth rollers adapted to imprint desired information on the surface of a fabricated cable when advanced thereby, and

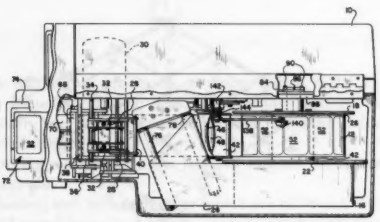
illuminated gauging means positioned downstream of said third and fourth rollers for providing a visual observation of the spacing of the conductors in a fabricated cable when advanced thereby.

4,351,690

LABEL PRINTER SYSTEM

Mark S. George, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Aug. 11, 1980, Ser. No. 177,025
Int. Cl.³ B65C *9/18*
U.S. Cl. 156—384 **21 Claims**



12. A printer system for printing upon labels having pressure sensitive adhesive on the reverse side thereof, said labels being mounted on a web of release material, and for thereafter removing said labels from said web, comprising:

stationary reel support means including a stationary support shaft,

a supply reel, mounted for free rotation on said reel support means, for supporting a supply roll of said release material having labels mounted thereon, said supply reel including a central hub including hub bearing means for providing free rotation of said supply reel about said stationary support shaft,

a take up reel, mounted for free rotation on said reel support means, for supporting a take up roll of said release material wound thereon, said web of release material extending along a supply path from said supply roll to said take up roll,

a printer, mounted adjacent said supply path, for printing on said labels,

web drive means, mounted adjacent said supply path between said printer and said taken up roll, for engaging said web and unreeling said web from said supply roll,

knife edge means, positioned between said printer and said web drive means, for defining a sharp bend in said web supply path to release said labels from said web as said web moves around said sharp bend, and

clutch means, interposed between said supply reel and said take up reel, for rotating said take up reel and said take up roll mounted thereon as said web is unreeled from said supply roll such that substantially the same length of said web of release material is wound onto said take up roll as is unreeled from said supply roll, said clutch means including

a clutch hub mounted for free rotation on said stationary support shaft,

clutch spring means, mounted on said stationary support shaft, for urging said clutch hub into contact with said central hub of said supply reel such that said clutch hub frictionally engages said central hub, and

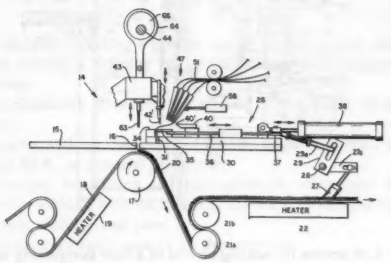
means for attaching said take up reel to said clutch hub, whereby relative rotational movement between said supply reel and said take up reel may be obtained when a torque is applied to said supply reel which is sufficient to overcome the frictional force between said central hub of said supply reel and said clutch hub of said clutch means.

4,351,691

APPARATUS FOR MAKING A TUFTED PRODUCT

Jack M. Schwartz, Rte. 1, Fairmont, Ga. 30755

Filed Nov. 24, 1980, Ser. No. 209,735
Int. Cl.³ D04H *11/00*
U.S. Cl. 156—435 **10 Claims**



1. Apparatus for producing tufted material, comprising:

a stationary bed;

an elongated primary tufting slot extending through said stationary bed;

means disposed adjacent one side of said stationary bed to support a tuft receiving backing material in proximate relation to said primary tufting slot;

a sliding bed disposed on the other side of said stationary bed, and selectably movable either to a forward position or a backward position relative to the stationary bed;

an elongated secondary tufting slot extending through said sliding bed, said secondary tufting slot being parallel to said primary tufting slot and being in overlying alignment with the primary tufting slot whenever said sliding bed is in said forward position;

yarn dispensing means disposed adjacent said sliding bed and operative to present plural strands of yarn to the sliding bed at a position spaced apart from said forward position;

yarn clamp means carried on said sliding bed and selectably operative at said spaced apart position to engage and hold said yarn strands, so that lengths of the yarn strands are withdrawn from said yarn dispensing means as said sliding bed moves toward said forward position;

cutting means movable with said sliding bed and operative in response to movement of said sliding bed toward said forward position to cut off a predetermined length of said withdrawn yarn strands, so that the cut lengths of yarn remain engaged by said clamp means and are carried to the forward position with the sliding bed;

said clamp means being operative to release said cut lengths of yarn when said sliding bed is at said forward location with said primary and secondary tufting in overlying alignment, so that the released cut lengths of yarn are disposed over the two aligned slots; and

tufting means positioned adjacent said other side of said stationary bed and disposed in alignment with said primary tufting slot, said tufting means being narrower than

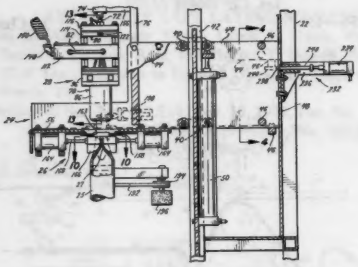
the width of said primary tufting slot and being operative to enter said aligned primary and secondary slots, thereby engaging said released cut lengths of yarn and carrying the yarn lengths through the aligned slots and into engagement with said tuft receiving backing material, so that each cut yarn length forms tufts extending outwardly from the backing material.

4,351,692

APPARATUS AND METHOD FOR AUTOMATICALLY FILLING AND HEAT WELD SEALING LENGTHS OF PLASTIC TUBING

Joseph F. Ouellette, Glendale, Mo., assignor to Ouellette Machinery Systems, Fenton, Mo.

Filed Jan. 7, 1981, Ser. No. 223,117
Int. Cl.³ B31F 1/00
U.S. Cl. 156—443 **18 Claims**



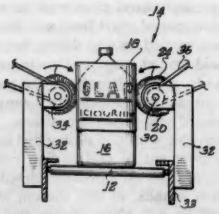
1. A device for sealing an end of a tube comprising means to hold, straighten, and align the tube during the sealing operation, means to abrade the inner surface of the tube end including an arm and a driven rotatable brush mounted thereon with means to selectively position the brush inside the tube end, means to heat the end of the tube being sealed, and means to fold, collapse, and squeeze said heated tube end as it cools, thereby sealing said tube end.

4,351,693

LABEL POSITIONER

Stuart C. Fuller, Riverside, Calif., assignor to Kerr Glass Manufacturing Corp., Los Angeles, Calif.

Filed Sep. 28, 1981, Ser. No. 306,248
Int. Cl.³ B65C 9/40
U.S. Cl. 156—556 **6 Claims**



1. In combination

a machine for applying tubular labels over the tops of cylindrical containers, conveyor means for carrying upright cylindrical containers downstream of said machine and a label positioner downstream of said machine for completing application of partially applied labels, said label positioner comprising:

roller means disposed above said conveyor means for tangentially contacting the labels on the conveyed containers, and

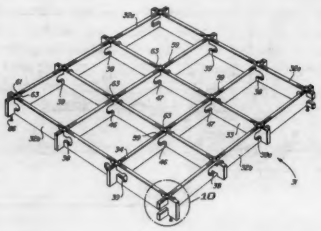
drive means for rotating said roller means in a direction which applies a downward stroke to the partially applied labels.

4,351,694

RACK FOR LAYING ITALIAN AND QUARRY TILE

Ronald R. Mathis, 3011 E. Wethersfield, Phoenix, Ariz. 85032

Filed Oct. 15, 1981, Ser. No. 311,520
Int. Cl.³ B44C 7/00
U.S. Cl. 156—574 **7 Claims**



1. A rack for laying tile comprising:

four edging strips arranged to form in end to end arrangement a right angle parallelogram,

one end of each edging strip being notched longitudinal of its length a given distance to receive cooperating notches formed in one of the other ends of said edging strips when they are arranged in end to end arrangement,

each of said edging strips being provided with a pair of like, spacedly arranged slots extending longitudinally thereof, the ends of which are enlarged,

at least one partition strip extending laterally between one pair of parallelly arranged edging strips,

at least another partition strip extending laterally between another pair of parallelly arranged edging strips,

one of said partition strips being provided between its ends with a longitudinally extending slot long and wide enough to receive longitudinally therethrough the other of said partition strips,

the other of said partition strips being notched inwardly of each of its edges at a point along its length corresponding to the position of said slot in said one of said partition strips,

said other of said partition strips when inserted in said slot of said one of said partition strips with its notches aligned with said slot of said one of said partition strips and rotated ninety degrees aligning edge to edge in a common plane with said edging strips and said one of said partition strips, and

a first means for then locking said partition strips in their relative positions.

4,351,695
METHOD OF PRODUCING LOW-RESISTANT, MONOCRYSTALLINE METALLIC LAYERS BY IMPLANTING IONS INTO A POLYCRYSTALLINE METAL LAYER AND HEATING TO PRODUCE A MONOCRYSTALLINE LAYER

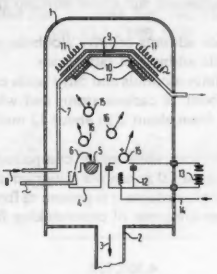
Konrad Hieber, and Norbert Mayer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 2, 1981, Ser. No. 222,019

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003285

Int. Cl.³ C30B *1/02, 29/02;* H01L *21/283*

U.S. Cl. 156—603 **12 Claims**



1. A method of producing monocrystalline metal layers having a low specific electrical resistance on substrates as are particularly useful in semiconductor and thin film technologies, comprising:

depositing a polycrystalline layer of a select metal onto a substrate;

implanting ions into such layer which are relatively inert to said metal so as to generate crystal lattice disruption in said metal layer; and

heating said substrate to a temperature in the range of about room temperature up to a maximum of about 350° C. so as to convert the resultant greatly disrupted polycrystalline metal layer into its monocrystalline state with a mean grain diameter greater than 100 times the layer thickness.

4,351,696
CORROSION INHIBITION OF ALUMINUM OR ALUMINUM ALLOY FILM UTILIZING BROMINE-CONTAINING PLASMA

Kenneth J. Radigan, Mountain View, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Oct. 28, 1981, Ser. No. 315,693

Int. Cl.³ H01L *21/306*

U.S. Cl. 156—643 **8 Claims**

4. A method for inhibiting corrosion of an aluminum or aluminum alloy film which has been etched in a reactor utilizing chlorinated plasma, comprising the sequential steps of:

(a) purging the reactor utilizing a combination of oxygen and nitrogen;

(b) introducting a bromine-containing gas into the reactor; and

(c) generating a bromine-containing plasma within the reactor.

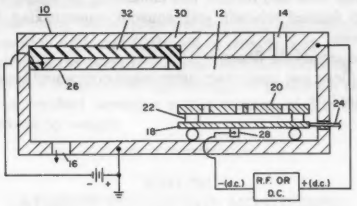
4,351,697
PRINTED WIRING BOARDS

Daniel J. Shanefield, Princeton Township, Mercer County, and Fred W. Verdi, Lawrence Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,980

Int. Cl.³ C23F *1/02*

U.S. Cl. 156—643 **9 Claims**



1. A method of making a printed circuit from a copper clad substrate having a plurality of spaced through-holes therein comprising:

(a) mechanically scrubbing the surface of the copper cladding;

(b) sputter etching the scrubbed surface so as to remove at least 50 A. of material therefrom;

(c) vacuum metallizing the through-holes subsequent to sputter etching without breaking the vacuum created for sputter etching; and then

(d) forming a circuit pattern on the substrate.

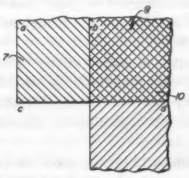
4,351,698
VARIABLE SLOPED ETCHING OF THIN FILM HEADS

John R. Osborne, Saratoga, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Oct. 16, 1981, Ser. No. 311,968

Int. Cl.³ C23F *1/02*

U.S. Cl. 156—661.1 **5 Claims**



1. A method of fabricating variable sloped, as well as straight, edges on the Ni-Fe body of a thin film head comprising:

A. forming a Ti layer on the Ni-Fe body covering at least those areas of the body to exhibit the variable slope;

B. forming a photoresist layer atop the Ti layer and Ni-Fe body;

c. removing the photoresist in those areas of the Ti layer and Ni-Fe body which are not to be retained as part of the thin film head after etching;

D. etching the thin film head with an etchant containing HF and $FeCl_3$ to form variable sloped edges in those areas of the Ni-Fe body covered with Ti and photoresist and straight edges at the boundary of those areas of the Ni-Fe body covered only with photoresist.

4,351,699

SOFT, ABSORBENT TISSUE PAPER

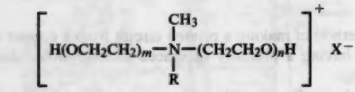
Thomas W. Osborn, III, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 15, 1980, Ser. No. 197,291
Int. Cl.³ D21H *3/12, 5/24*
U.S. Cl. 162—112 **22 Claims**

1. A process for making a soft, absorbent tissue paper web comprising the steps of forming an aqueous papermaking furnish, depositing said furnish on a foraminous surface, removing the water from said furnish, and enhancing the strength of the web so formed wherein said aqueous papermaking furnish comprises:

(a) papermaking fibers;

(b) at least one quaternary ammonium compound having the structure



wherein R is an aliphatic hydrocarbon radical selected from the group consisting of alkyl radicals having from about 12 to about 18 carbon atoms, alkylene radicals having from about 12 to about 18 carbon atoms, coconut, and tallow, X is halogen, m and n are both integers each having a value of at least 1, and the sum of m and n is from about 2 to about 15; and

(c) at least one nonionic surfactant selected from the group consisting of

(1) ethylene oxide adducts of fatty alcohols; and

(2) ethylene oxide adducts of fatty acids

wherein said fatty alcohols and fatty acids each have from about 12 to about 18 carbon atoms and wherein said adducts contain from about 2 to about 12 moles of ethylene oxide;

wherein said quaternary ammonium compound is present at from about 0.5 to about 5.0 grams per kilogram of papermaking fiber and said nonionic surfactant is present at from about 0.5 to about 5.0 grams per kilogram of papermaking fiber.

8. A process for making a soft, absorbent tissue paper web comprising the steps of

(1) forming an aqueous papermaking furnish;

(2) forming from said papermaking furnish a fibrous pattern densified embryonic web having a multiplicity of discrete zones of relatively high density disposed in a predetermined pattern array;

(3) supporting said embryonic web on an array of spaced supports so that each of a predetermined sub-array of said high density zones is justaposed one of a predetermined sub-array of said supports;

(4) at least partially impregnating at least a substantial proportion of the supported predetermined sub-array of said high density zones with a binder by biasing said predetermined sub-array of said supports towards a contacting type impregnating means with said sub-array of said high density zones disposed between said sub-array of said supports and said impregnating means;

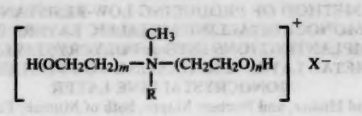
(5) drying said embryonic web; and

(6) creping said dried web

wherein said papermaking furnish is an aqueous slurry comprising:

(a) papermaking fibers;

(b) at least one quaternary ammonium compound having the structure



wherein R is an aliphatic hydrocarbon radical selected from the group consisting of alkyl radicals having from about 12 to about 18 carbon atoms, alkylene radicals having from about 12 to about 18 carbon atoms, coconut, and tallow, X is halogen, m and n are both integers each having a value of at least 1, and the sum of m and n is from about 2 to about 15; and

(c) at least one nonionic surfactant selected from the group consisting of

(1) ethylene oxide adducts of fatty alcohols; and

(2) ethylene oxide adducts of fatty acids

wherein said fatty alcohols and fatty acids each have from about 12 to about 18 carbon atoms and wherein said adducts contain from about 2 to about 12 moles of ethylene oxide;

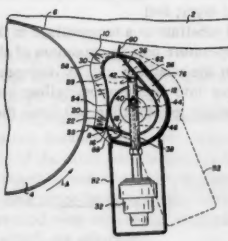
wherein said quaternary ammonium compound is present at from about 0.5 to about 5.0 grams per kilogram of papermaking fiber and said nonionic surfactant is present at from about 0.5 to about 5.0 grams per kilogram of papermaking fiber.

4,351,700

STEAM DISTRIBUTION APPARATUS FOR THE NIP OF TWO ROLLS

Norman F. Dove, 3187 Hoskins Rd., N. Vancouver, British Columbia, Canada (37J 3B5)

Filed Jun. 23, 1980, Ser. No. 162,270
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ D21F *5/02*
U.S. Cl. 162—252 **20 Claims**



1. Apparatus to supply steam to a paper sheet that passes by the apparatus from a leading edge to a trailing edge of the apparatus, the apparatus being adapted to be positioned adjacent the nip of two rolls and comprising:

a first header for steam;

a first chamber to receive steam from the first header;

passages for steam between the first header and the first chamber;

an outlet in the first chamber whereby steam may be forced against the paper sheet adjacent the leading edge of the apparatus to form a steam curtain to reduce the amount of air drawn under the apparatus by the paper sheet;

a second chamber to receive steam from the first header;

passages for steam between the first header and the second chamber;

outlets in the second chamber whereby steam may be forced against the paper sheet to heat the sheet;

regulating means to control the flow of steam along the length of the apparatus; the first and second chambers being formed on the exterior of the first header with a

portion of the first header forming a wall of the first chamber and a further portion of the first header forming a wall of the second chamber;

an inner wall of the apparatus conforming generally to the shape of an adjacent portion of a roll surface; and

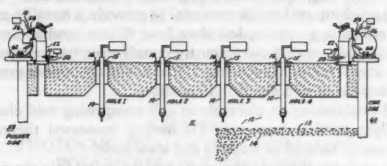
a first part of said inner wall forming a wall of said first chamber and containing the outlet in the first chamber, a second part of said inner wall forming a wall of second chamber and containing said outlets in the chamber.

4,351,701

METHOD OF CONTROLLING A COKING CYCLE

Edmund G. Bauer, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 12, 1981, Ser. No. 224,405
Int. Cl.³ C10B *5/00*
U.S. Cl. 201—1 **5 Claims**



1. A method of determining the devolatilization endpoint during a coking cycle comprising:

(a) providing a probe adapted to measure the effective thickness of a layer of carbon deposited by gas released from coal during a coking cycle,

(b) positioning said probe such that it is exposed to said gas, and

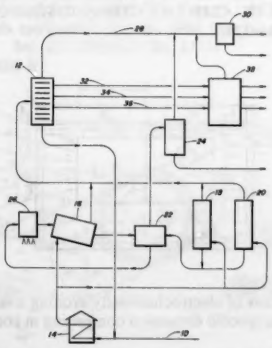
(c) determining endpoint of devolatilization by providing means electrically connected to said probe to indicate effective thickness of carbon having a maximum value.

4,351,702

PROCESSING OF HEAVY HIGH-SULFUR FEEDSTOCKS

Bruce A. Newman, and Lyndon D. Boyer, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 8, 1981, Ser. No. 299,747
Int. Cl.³ C10B *55/04, 57/00, 57/02*
U.S. Cl. 201—5 **5 Claims**



1. A process for making low-sulfur metallurgical coke from heavy high-sulfur hydrocarbonaceous feedstock comprising:

(a) heating said feedstock to coking temperature;

(b) passing a first portion of said heated feedstock to a delayed coking operation;

(c) passing a second portion of said heated feedstock to a formcoking operation;

(d) passing delayed coke product from said delayed coking operation and formcoke product from said formcoking operation to a screening operation;

(e) returning undersize material from said screening operation to said formcoking operation;

(f) passing overhead vapors from said coking steps to a fractionation operation;

(g) recovering gas and liquid products from said fractionation operation;

(h) combining the bottoms fraction from said fractionation operation with said feedstock as recycle; and

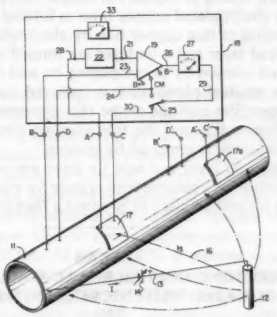
(i) calcining the oversize material from said screening operation at a temperature high enough to produce a calcined coke product having a sulfur content of less than 1.5 percent by weight.

4,351,703

CATHODIC PROTECTION MONITORING

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 729,312, Oct. 4, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,149
Int. Cl.³ G01N *27/46*; C23F *13/00*
U.S. Cl. 204—1 T **21 Claims**



1. A method for cathodic protection monitoring of a metallic structure located in an earth region or in a body of water and subjected to cathodic protective currents from a remote anode electrode, comprising the steps of;

(a) positioning a metallic specimen closely adjacent to but not in direct electrical contact with the structure and having exposed to the cathodic current a known surface area of at least one magnitude less than the structure, said metallic specimen being of like metallic material to said structure;

(b) inducing current flow between the specimen and the structure until the potential difference between the specimen and the structure is substantially zero;

(c) measuring the current flow between the specimen and the structure;

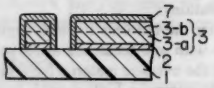
(d) determining the current density impressed upon the specimen which current density is substantially identical to the current density impressed upon exposed like areas of the structure by cathodic current from the remote anode electrode; and

(e) employing an anodic or cathodic induced current flow for varying the potential of the specimen relative to the structure to determine the anodic or cathodic reaction rate, respectively, the unprotected corrosion rate of the structure, and the cathodic current required to protect the structure.

4,351,704
PRODUCTION METHOD FOR SOLDER COATED CONDUCTOR WIRING

Keisuke Kurihara, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,575
Claims priority, application Japan, Feb. 20, 1980, 55-19207
Int. Cl.³ C25D *5/02, 5/10, 5/50*
U.S. Cl. 204—15 **10 Claims**

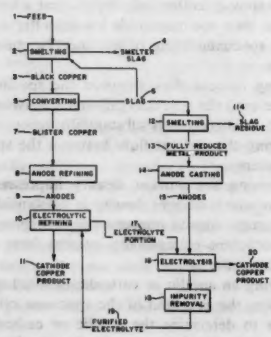


1. A production method for solder coated conductor wiring comprising the following steps (a) through (g):
(a) a thin metal film selected from the group consisting of chromium, nichrome and titanium is formed on a ceramic substrate by vacuum deposition or sputtering,
(b) a thin copper film is formed on said thin metal film by vacuum deposition or sputtering,
(c) a photo-resist is coated on said thin copper film surface, then developed to remove the photo-resist from the portions of the thin copper film which represent conductors of the wiring to expose the copper of these portions,
(d) an electroplated copper layer is formed on said exposed portions of thin copper film by electroplating,
(e) a lead layer and a tin layer are formed separately superposed relation by electroplating on said copper layer,
(f) the residual photo-resist is removed and then said thin copper film and one of the thin chromium film, the thin nichrome film and the thin titanium film underlying the photo-resist is removed by etching,
(g) said lead layer and said tin layer are subjected to heat treatment at a suitable temperature for converting the lead and tin into an alloy to produce a lead-tin solder.

4,351,705
REFINING COPPER-BEARING MATERIAL CONTAMINATED WITH NICKEL, ANTIMONY AND/OR TIN

Runyon G. Ernst, deceased, late of Woodbridge, N.J.; by Margaret Ernst, executrix, Jamesburg, N.J.; William R. Opie, Holmdel; Harold P. Rajcevic, Colonia, both of N.J., and Peter D. Parker, Brooklyn, N.Y., assignors to Amax Inc., Greenwich, Conn.

Filed Jun. 30, 1981, Ser. No. 278,928
Int. Cl.³ C25C *1/12*
U.S. Cl. 204—108 **20 Claims**

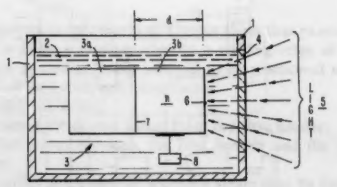


1. A process for producing high-purity copper from feed material containing copper contaminated with iron and one or more inpurity metals selected from the group consisting of nickel, antimony, and tin, which comprises
(1) treating the feed material to form therefrom an anode consisting essentially of copper and said one or more impurity metals, in amounts no greater than about 1 wt.% nickel, about 0.4 wt.% antimony, and about 0.2 wt.% tin,
(2) electrolytically refining the anode from step (1) in an electrolytic cell comprising an aqueous sulfuric acid electrolyte in which are immersed the anode from step (1) and a cathode, by impressing between said anode and said cathode a voltage effective to dissolve copper from said anode and preferentially deposit high-purity copper onto said cathode, wherein copper dissolves into said electrolyte at a rate which exceeds the rate of deposition of copper onto said cathode,
(3) withdrawing a portion of the electrolyte,
(4) providing oxidic material containing copper, iron, and said one or more impurity metals, said oxidic material being selected from the group consisting of copper converter slags and roasted cupriferous concentrates,
(5) smelting said oxidic material to provide a metallic anode containing copper, less than 2 wt.% iron, and an amount of said one or more impurity metals effective, on application of the voltage in step (7), to lower the copper concentration in said electrolyte portion,
(6) establishing an electrolytic cell comprising said electrolyte portion from step (3) having immersed therein in anode formed in step (5) and a cathode,
(7) applying between the anode and the cathode in the cell of step (6) a voltage effective to dissolve the anode in said electrolyte portion and to preferentially deposit copper from said electrolyte portion onto the cathode, whereby the copper concentration in said electrolyte portion is lowered and said one or more impurity metals become associated with said electrolyte portion,
(8) further treating said electrolyte portion to remove from association therewith an amount of said one or more impurity metals at least equal to the amount thereof contained in the anode formed in step (5), thereby providing a purified electrolyte portion, and
(9) returning said purified electrolyte portion to step (2).

4,351,706
ELECTROCHEMICALLY ERODING SEMICONDUCTOR DEVICE

Terry I. Chappell, Amawalk; Geroge D. Pettit, Mahopac, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,723
Int. Cl.³ C25F *3/12;* **C23F** *1/02;* **H01L** *21/42*
U.S. Cl. 204—129.3 **9 Claims**



1. A process of electrochemically eroding a semiconductor member to a specific dimension comprising in combination the steps of:
immersing at least the region to be eroded of a semiconductor body in a fluid, said region being unbiased with respect to said fluid and said fluid having the property that erosion of said semiconductor by said fluid occurs only in the presence of electric current flowing from said semiconductor into said fluid, and

illuminating said semiconductor with light having a frequency capable of penetrating into said semiconductor in the vicinity of said specific dimension.

4,351,707

METHODS EMPLOYING MAGNETIC ISOTOPE EFFECT

Nicholas J. Turro, Tenafly, N.J., assignor to Alpine Kinetics, Inc., Northvale, N.J.

Filed Nov. 8, 1979, Ser. No. 92,483
Int. Cl.³ C07G 13/00
U.S. Cl. 204—158 R 14 Claims

13. A method of isotope enrichment of a chemical compound having both magnetic and non-magnetic isotopes of a chemical element, comprising forming radical pairs in the triplet state from molecules of the compound, some of said radical pairs including a magnetic isotope of the chemical element and other radical pairs including a non-magnetic isotope of the chemical element, and providing for said radical pairs an environment of restricted dimensionality such that the radical pairs containing said magnetic isotope are preferentially converted to the singlet state wherein the environment of restricted dimensionality is selected from the group consisting of micelles, gels, molecular sieves, vesicles, liquid crystals, and clathrates.

4,351,708

PHOTOCHEMICALLY OR THERMALLY POLYMERIZABLE MIXTURES

Godwin Berner, Rheinfelden, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,463
Claims priority, application Switzerland, Feb. 29, 1980, 1629/80
Int. Cl.³ C08F 2/46
U.S. Cl. 204—159.23 14 Claims

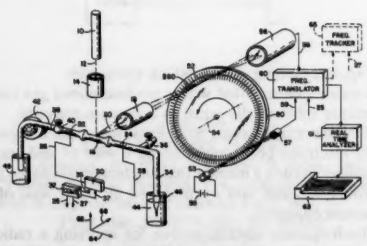
1. A photochemically or thermally polymerisable mixture containing (A) one or more cationically polymerisable compounds, (B) an aromatic iodonium salt as the polymerisation catalyst, (C) one or more photoinitiators which is an aromatic carbonyl compound, as the co-catalyst, and (D) an agent which forms free radicals on heating, as the second co-catalyst.

4,351,709

METHOD OF OBTAINING THE MEAN ELECTROPHORETIC MOBILITY OF PARTICLES

Philip J. Goetz, 56 Brook Manor, Pleasantville, N.Y. 10570

Division of Ser. No. 16,181, Feb. 28, 1979, Pat. No. 4,239,612, which is a division of Ser. No. 767,770, Feb. 11, 1977, Pat. No. 4,154,669. This application Oct. 30, 1980, Ser. No. 202,067
Int. Cl.³ G01N 27/00, 27/26
U.S. Cl. 204—180 R 9 Claims



4. The method of obtaining the mean electrophoretic mobility of particles moving under the influence of an applied electric field comprising the steps of:

illuminating the moving particles,

modulating the images corresponding to said moving particles with a moving grating to obtain a spectral signal having a primary frequency component related to the mean electrophoretic mobility of said moving particles,

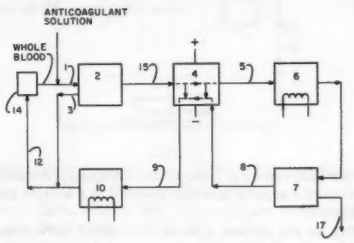
processing said spectral signal to compute said mean electrophoretic mobility.

4,351,710

FRACTIONATION OF PROTEIN MIXTURES

Surendar M. Jain, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 111,144, Jan. 10, 1980, Pat. No. 4,276,140. This application Dec. 15, 1980, Ser. No. 216,719
The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.
Int. Cl.³ B01D 57/02
U.S. Cl. 204—180 P 18 Claims



1. A process for separating an aqueous protein mixture into fractions having intrinsically distinguishable compositions comprising removing substantially all the turbidity therefrom, subsequently decreasing the salt content thereof by passing said mixture at a velocity of between 3–40 cm/sec. into and out of an electrodialysis apparatus containing at least one pair of contiguous membranes defining a liquid flow chamber therebetween, impressing an electric current across said apparatus at about a CD/K=0.1 to 10 (where CD is current density in m-amps/cm^2 and K is the conductivity of the aqueous mixture in milli Siemens/cm) thereby altering the ionic environment of said mixture by decreasing its ionic concentration sufficiently to at least partially destabilize one or more proteins in said mixture, allowing said destabilized protein to form turbidity, subsequently removing substantially all of said turbidity and maintaining the temperature of said mixture during the said separation in the range of between about 0°–40° C.

4,351,711

ELECTROPHORESIS METHOD FOR DETECTING GLYCOSYLATED HEMOGLOBIN IN BLOOD

Jeffrey Ambler, Newthorpe, England, assignor to Gelman Sciences, Inc., Ann Arbor, Mich.

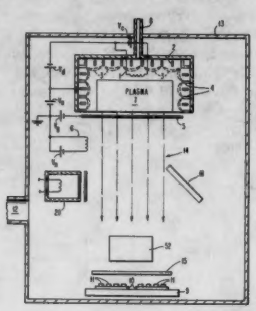
Filed Apr. 21, 1981, Ser. No. 256,201
Int. Cl.³ B01D 13/02
U.S. Cl. 204—180 G 8 Claims

1. A method for electrophoretically separating glycosylated hemoglobin from non-glycosylated hemoglobin in a blood sample, said method comprising placing a medium with the blood sample thereon in a buffer solution, and then passing an electric current through said solution to cause the blood to separate on said medium into fractions having different mobilities, the buffer solution which is in contact with the blood sample containing dextran sulphate to effect a change in the relative mobilities of the glycosylated hemoglobin and the non-glycosylated hemoglobin fractions in the blood whereby the glycosylated hemoglobin is separated from the non-glycosylated hemoglobin during passage of the electric current.

4,351,712
LOW ENERGY ION BEAM OXIDATION PROCESS

Jerome J. Cuomo, Lincolndale, and James M. E. Harper, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,929
Int. Cl.[3] C23C *15/00*; H01L *39/22*
U.S. Cl. 204—192 EC 12 Claims



1. A surface reaction process for compound formation on the surface of a sample material situated in a sample chamber, comprising:

forming an ion plasma with an ion source having magnetic field producing means located around a plasma discharge chamber of said ion source,

feeding a gas into said ion plasma which will form a solid compound product when ions of said gas react with said surface of said sample material,

extracting said ions of said gas out of said ion plasma to form an ion beam, and

applying a voltage potential to said ion source which will accelerate ions of said gas to a low energy in a directed beam which impinges onto said surface of said sample material to produce simultaneous sputter etching and compound formation on said surface, said voltage potential being used to determine the resulting compound thickness, wherein the rate of compound formation balances the rate of sputter etching at said resulting thickness.

4,351,713
ELECTRO-CO-DEPOSITION OF CORROSION RESISTANT NICKEL/ZINC ALLOYS ONTO STEEL SUBSTRATES

Theodore A. Hirt, and Robert H. Dillon, both of Warren, Ohio, assignors to Thomas Steel Strip Corp., Warren, Ohio

Division of Ser. No. 68,877, Aug. 22, 1979, Pat. No. 4,282,073.
This application Mar. 5, 1981, Ser. No. 240,760
Int. Cl.[3] C25D *17/00*
U.S. Cl. 204—207 3 Claims

1. An apparatus for the continuous plating of corrosion resistant coatings on iron or steel strip substrates which comprises,

in combination,

a plating line including a seriatim arrangement of cleansing and plating tanks,

liquid segregation means between said tanks,

and strip propulsion and advancing means;

said plating tanks including

a first nickel plating section fitted with nickel anodes and filled with a nickel ion-containing electrolyte and means for making said strip cathodic to deposit a substantially pure nickel priming layer on said strip,

and a second alloy plating section fitted with zinc and nickel anodes and filled with an electrolyte maintained at a temperature range of 135° F. to 145° F., said electrolyte containing nickel and zinc ions,

wherein the combined metal ion-content of nickel and zinc in the electrolyte is in the range of 10 to 25 oz/gal, the ratio of nickel to zinc in the electrolyte is in the range of 0.1 to 1 to 0.4 to 1 and the nickel ion content is in the range 1.4 to 3.5 oz/gal,

said alloy plating section containing means for making said strip cathodic and providing a cathodic current density to said strip in the range of 15 to 120 amperes per square foot of strip;

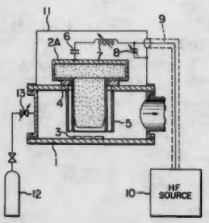
whereby the strip, after cleansing is advanced by said propulsion means to said first nickel plating section for the application of a nickel priming layer and then is advanced to said second section where said primed strip is then coated with a corrosion-resistant electrodeposited layer of a nickel/zinc alloy having a content of 10% to 14% nickel, the balance being zinc,

wherein said first plating section and said second plating section are successive sections of a contiguous plating tank both sections of which are filled with the electrolyte of said second section, and wherein the current density in said first section is adjusted by said cathodic making means at less than about 10 amperes per square foot, then rising up to 15 to about 120 amperes per square foot for the subsequent alloy deposition.

4,351,714
SPUTTER-ETCHING DEVICE

Noboru Kuriyama, Yokohama, Japan, assignor to Kabushiki Kaisha Tokuda Seisakusho, Kanagawa, Japan

Filed Apr. 21, 1981, Ser. No. 256,033
Claims priority, application Japan, Apr. 30, 1980, 55-57466
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—298 10 Claims



1. A sputter-etching device which comprises:

a vacuum chamber filled with a predetermined gas under a pressure substantially equal to a vacuum pressure;

a hollow electrode having an internal space and an opening, said electrode being mounted on a wall of said vacuum chamber in such a manner that an electric discharge gap is formed between said opening and an inner wall of said vacuum chamber;

a radio-frequency electric source for applying a radio-frequency voltage between said electrode and said vacuum chamber; and

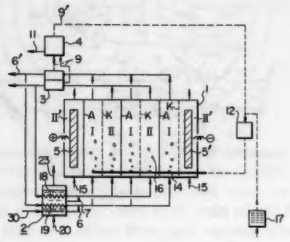
discharge starting means for starting an electric discharge between said electrode and said vacuum chamber,

thereby to subject an object to be processed to sputter-etching.

4,351,715
APPARATUS FOR HIGH TEMPERATURE ELECTRODIALYSIS

Harumi Matsuzaki; Osamu Kuroda; Isao Okouchi, all of Hitachi; Kenkichi Izumi, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 138,975, Apr. 10, 1980, Pat. No. 4,311,575.
This application Mar. 2, 1981, Ser. No. 239,578
Claims priority, application Japan, Apr. 18, 1979, 54-46640
Int. Cl.[3] B01D *13/02*
U.S. Cl. 204—301 7 Claims



1. An apparatus for electrodialysis for desalting or concentrating an electrolyte solution comprising:

at least a pair of electrodes immersed in the electrolyte solution;

a plurality of separate anion and cation ion exchange membranes alternately juxtaposed between the pair of electrodes and immersed in the electrolyte solution, thereby forming alternate juxtaposed desalting chambers and concentrating chambers;

gas supply means for dispersing a gas in a bubble state into the chambers through the electrolyte solution between the ion exchange membranes, thereby making the gas contact the electrolyte solution;

heater means for heating at least one of the electrolyte solution and the gas being provided, thereby providing a temperature difference between the gas and the electrolyte solution, said heater means being separate from and in addition to said electrodes; and

condenser means for condensing vapor in the gas after the contact of the gas and the electrolyte solution, thereby obtaining a condensate from the gas.

4,351,716
LIQUEFACTION PROCESS

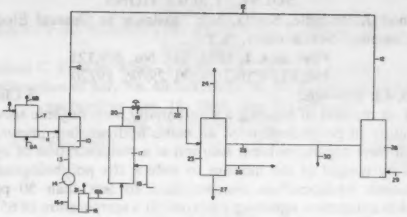
Martin L. Gorbaty, Westfield, N.J.; John B. Stone, and Syamal K. Poddar, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 15, 1979, Ser. No. 20,603
Int. Cl.[3] C10G *1/02*
U.S. Cl. 208—8 LE 14 Claims

1. A process for the liquefaction of a lower ranking coal comprising the steps of:

(a) contacting said coal with a gaseous mixture comprising sulfur dioxide and an oxidizing agent so as to reduce the amount of alkaline earth metal humates therein;

(b) liquefying the thus treated coal at liquefaction conditions to produce a petroleum-like product; and

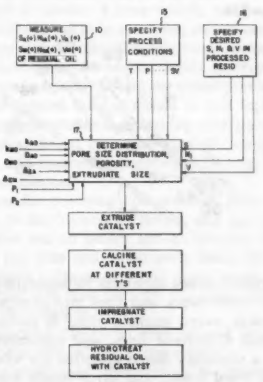


(c) recovering the liquid product from the unliquefied portion of the pretreated coal.

4,351,717
CATALYST FOR HYDROTREATING RESIDUAL PETROLEUM OIL

Stephen B. Jaffe, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 822,495, Aug. 8, 1977, Pat. No. 4,267,071.
This application Nov. 21, 1980, Ser. No. 208,956
Int. Cl.[3] C10G *45/08*
U.S. Cl. 208—216 PP 9 Claims



1. A process for catalytically demetalizing and desulfurizing a residual oil comprising:

measuring the size distribution of sulfur, nickel and vanadium containing molecules in said residual oil,

determining from said measured size distribution the pore size distribution, porosity and extrudate size of a catalyst producing desired demetalation and desulfurization of said residual oil for specified conditions of temperature, pressure and space velocity,

producing an alumina having deposited thereon an oxide or a sulfide of a Group VI-B metal and an iron group metal thereby forming said catalyst having said determined pore size distribution, and

contacting said residual oil with hydrogen in the presence of said catalyst at about said specified process conditions whereby inducing said optimum demetalization and desulfurization during said contacting step.

4,351,718

METHOD FOR REMOVING POLYHALOGENATED HYDROCARBONS FROM NONPOLAR ORGANIC SOLVENT SOLUTIONS

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,121
Int. Cl.[3] C10G *29/00, 29/06, 29/20*
U.S. Cl. 208—262 5 Claims

1. A method of treating a substantially inert organic solvent solution of polyhalogenated aromatic hydrocarbon present in such inert organic solvent solution at a concentration of up to 1% by weight of the mixture to reduce the polyhalogenated aromatic hydrocarbon concentration to less than 50 ppm, which comprises, agitating a mixture at a temperature of 65° C. to 200° C. comprising such substantially inert organic solvent solution of polyhalogenated aromatic hydrocarbon, polyalkyleneglycol having a molecular weight of about 200 to about 5000 and alkali metal hydroxide for a time which is at least sufficient to effect the minimum aforedescribed reduction in concentration of the polyhalogenated aromatic hydrocarbon in the agitated mixture which comprises by weight

(A) up to about 1% of polyhalogenated aromatic hydrocarbon,

(B) about 0.1 to 10% of polyalkyleneglycol,

(C) about 0.1 to 10% of alkali metal hydroxide, and

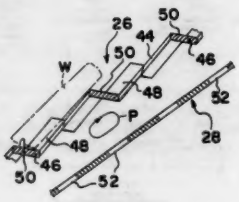
(D) about 80 to 99.8% of substantially inert organic solvent, where the sum of (A)+(B)+(C)+(D) is equal to 100%.

4,351,719

VIBRATING SCREEN APPARATUS

Larry L. Morey, Mount Pleasant, Mich., assignor to Morbark Industries, Inc., Winn, Mich.

Filed Feb. 19, 1981, Ser. No. 236,032
Int. Cl.[3] B07B *1/28, 9/00*
U.S. Cl. 209—234 7 Claims



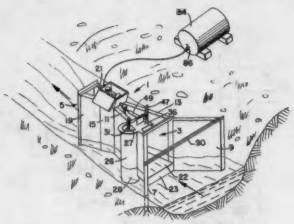
1. In a vibratory screen apparatus for separating wood chips, elongate and other overs, and fines into groups of relatively large A particle overs, medium sized B particle chips and relatively small C particle fines, said apparatus including a fixed frame, a vibratory frame mounted for vibratory movement on said fixed frame, and drive means for driving said vibratory frame in vibratory movement on said fixed frame; vertically spaced upper and lower co-extending screens mounted upon said vibratory frame, said screens being inclined upwardly from lower ends to upper ends disposed generally vertically above the lower ends, conveying means for depositing wood chip material of random sizes upon the upper surface of said upper screen adjacent the upper end thereof, said upper screen having openings therethrough sized to permit B and C particles to pass through said upper screen while retaining A particles on the upper surface thereof and said lower screen having openings therethrough sized to permit C particles to pass through said lower screen while retaining B particles on the upper surface thereof, said lower screen comprising rows of laterally spaced apart fine passing openings; said upper screen comprising vertically extending rows of vertically spaced and aligned transversely extending elongate horizontal abutment bars, each joined at its end by a divergent bar to two such horizontal bars in the adjacent row and each bar spanning several laterally spaced openings in the lower screen, and means vibrating the screens to oppose gravitational flow of the material so that the bars intercept and impart intermittent upward movements to the material.

4,351,720

WATER TREATING APPARATUS

Clyde E. Bailes, Box 512, Summersville, W. Va. 26651

Filed Jun. 18, 1981, Ser. No. 274,924
Int. Cl.[3] C02F *1/66*
U.S. Cl. 210—101 12 Claims



1. A water treating apparatus comprising:

front side walls;

intermediate side walls;

central side walls;

rear side walls;

a bottom wall between said side walls;

a float housing on one of said intermediate side walls;

a float supported on a vertically movable rod within said float housing;

a chemical solution holding housing on top of said walls;

a valve exterior of said chemical solution holding housing and communicating with the interior thereof;

means supported on support means and interconnected with said float and said valve operable in response to upward or downward movement of said float to open or close said valve in response to water or liquid flow through said apparatus;

a valve within said chemical solution holding housing; and

a bulk storage container connected to said valve within said chemical solution holding housing whereby said container is replenished with a chemical solution.

4,351,721

DEVICE FOR FLUSHING AND AERATING A SURFACE COATED WITH MICROORGANISMS IN A PLANT FOR BIOLOGICAL PURIFICATION OF WASTE WATER

Aksel S. Frandsen, Vandværksvej 35, Borkop, Denmark

PCT No. PCT/DK80/00037, § 371 Date Feb. 26, 1981, § 102(e) Date Feb. 11, 1981, PCT Pub. No. WO81/00101, PCT Pub. Date Jan. 22, 1981
PCT Filed Jun. 25, 1980, Ser. No. 233,310
Claims priority, application Denmark, Jun. 26, 1979, 2676/79
Int. Cl.[3] C02F *3/08*
U.S. Cl. 210—150 4 Claims

1. A purification apparatus for alternately flushing and aerating water supplied from a body of water comprising:

a first spirally coiled tube;

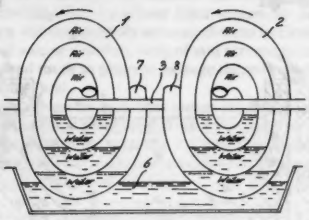
a second spirally coiled tube, oppositely directed and in lateral coaxially spaced relation to said first spirally coiled tube;

a conduit connected to and communicating with the centers of said first and second spirally coiled tubes;

a particulate medium on which microorganisms can grow placed within each of said first and second spirally coiled tubes;

a means for rotating said first and second spirally coiled tubes about an axis passing through said conduit, said axis

placed above and at such distance from the surface of the water such that when said first and second spirally coiled tubes are rotated the outer free opening of said first spirally coiled tube is disposed below the surface of the body of water during part of its rotation and serves as in inlet alternately for water and air and the outer free opening of



said second spirally coiled tube is disposed below the surface of the water during part of its rotation and serves as an outlet alternately for air and water whereby the effect of admission of water to the inlet of said first spirally coiled tube and efflux from said second spirally coiled tube provides a torque which assists in rotating the spirally coiled tubes.

4,351,722

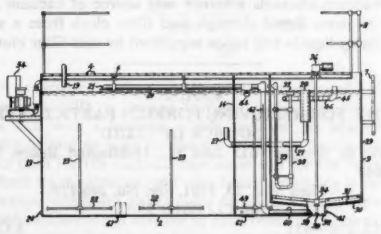
WATER TREATMENT PLANT

James A. Mixon, Jacksonville, Fla., assignor to American Enviro-Port, Inc., Jacksonville, Fla.

Filed Mar. 1, 1978, Ser. No. 882,437

Int. Cl.³ C02F *3/22*

U.S. Cl. 210—195.3 **12 Claims**



1. In a water treatment plant, a generally horizontal elongated first cylindrical tank having a longitudinal axis, an elongated cylindrical upstanding second tank having a cylindrical wall and generally vertical axis, said second tank including a bottom portion having a circular bottom inner surface and an outlet and scraper means disposed in said bottom portion for moving sediment material from said bottom inner surface into said outlet, said longitudinal axis of said first tank being substantially perpendicular to said vertical axis of said second tank, and said first tank having a planar wall integrally attached to and laterally intersecting said wall of said second tank along a substantial portion of the length of said second tank.

6. In a water treatment plant, a generally horizontal cylindrical elongated first tank having first and second end portions and a longitudinal axis, said first end portion having a planar end wall through which said longitudinal axis extends, an upstanding cylindrical second tank having a bottom portion and an upper portion thereabove, said second tank intersecting and integrally attached to said end wall so that part of said second tank is disposed outwardly of said planar end wall, said longitudinal axis of said first tank being substantially perpendicular to the vertical axis of said second tank, and the width of the intersecting portion of said second tank being less than the width of said planar end wall.

4,351,723

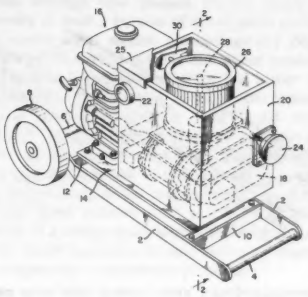
MEANS FOR REMOVING RESIDUAL WATER FROM A SURFACE

Michael C. Palmer, 8938 - 179 Pl., SW., Edmonds, Wash. 98020

Continuation of Ser. No. 40,859, May 21, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,233

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—198.1 **1 Claim**



1. An apparatus for removing liquid from a substantially flat surface such as a floor, comprising:

framework means;

substantially closed reservoir means mounted on said framework means for holding a liquid, such as water, said reservoir means having an inlet port near the top thereof which is adapted to receive a hose which, in operation, is extended to the liquid to be removed, and an outlet port near the bottom thereof, the inlet port being located above the typical level of liquid in said liquid reservoir when the apparatus is in operation, and the outlet port being located below the typical level of liquid in said liquid reservoir when the apparatus is in operation, said apparatus means being characterized by an absence of means to prevent liquid in said reservoir means from flowing through the outlet port thereof;

pump means for pumping compressible fluid, such as air mounted on the framework means, said pump means having an inlet and an outlet, and an internal configuration between the inlet and outlet such that a liquid, such as water, which is drawn into said pump means through the inlet thereof will flow through the pump means and exit through the outlet thereof;

means connecting the outlet port of said liquid reservoir means to the inlet of said pump means;

filter means positioned upstream of the pump means for filtering liquid from said reservoir means prior to the liquid reaching the pump means; and

aeration means including a conduit having a first open end within the throat of the pump and extending to a position whereat the second open end is continuously in communication with the ambient atmosphere.

4,351,724

FILTER ASSEMBLY HAVING SIDE-SUPPORTED SLIDABLE KING AND QUEEN ENDS

Paul F. Jones, Newcastle-Under-Lyme, England, assignor to Johnson-Progress, Limited, Stoke-on-Trent, England

Filed Feb. 5, 1980, Ser. No. 118,386

Claims priority, application United Kingdom, Feb. 7, 1979, 7904285

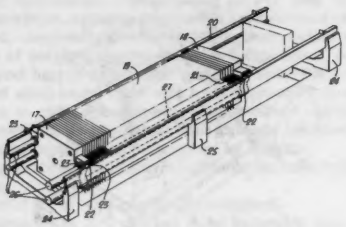
Int. Cl.³ B01D *25/34*

U.S. Cl. 210—230 **5 Claims**

1. A filter press comprising a pair of fixed side bars extending

horizontally one along each side of the press, a stack of filter plates disposed between the side bars and all supported on the side bars for individual sliding movement therealong by means of pins projecting laterally from the sides of the plates and resting on the side bars, a king end and a queen end at opposite ends of said stack of filter plates and each likewise supported on the side bars for individual sliding movement therealong by means of pins projecting laterally from the sides of said king end and said queen end, and

fluid-operated piston-and-cylinder units mounted on said king end to float therewith on the said side bars,



said piston-and-cylinder units having their axes parallel to said side bars and being disposed at opposite sides of said king end adjacent interiorly of said side bars and longitudinal tie rods coupling said queen end to said piston-and-cylinder units thereby to close the press by pulling said queen end toward said king end,

said tie rods being disposed at opposite sides of said stack of filter plates and lying between said stack and said side bars.

4,351,725

PLATE FILTER PRESS WITH STOP RAILS FOR PLATE GUIDANCE

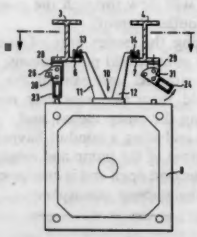
Karl A. Rademacher, Wuppertal, and Max Oelbermann, Remscheid, both of Fed. Rep. of Germany, assignors to Rittershaus & Blecher GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jan. 30, 1981, Ser. No. 229,836

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 8002233[U]

Int. Cl.³ B01D *25/12*

U.S. Cl. 210—230 **21 Claims**



1. Plate filter press comprising a plurality of filter plates, each of which is centrally suspended on support guide means for horizontal displacement on a path therealong, and stop rail means positioned parallel to said horizontal displacement path for preventing pendulating oscillations of the filter plates, said stop rail means being mounted for displacement between a first, filter plate guiding, position adjacent the filter plates and a second, non-guiding position, displaced from the filter plates, wherein filter replacement is facilitated.

4,351,726

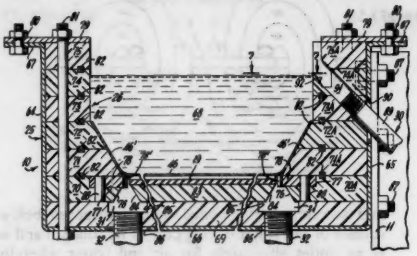
TRAVELING BELT FILTER HAVING VACUUM CHANNELS FORMED ALONG EDGES OF SAID BELT

Robert L. Somerville, Old Amwell Rd., Rte. 1, Box 256, Neshanic, N.J. 08853

Filed Apr. 3, 1981, Ser. No. 250,647

Int. Cl.³ B01D *33/00*

U.S. Cl. 210—401 **16 Claims**



1. Filter apparatus having a traveling belt comprising an elongated filtering trough having a base and side walls, a roller adjoining each end of said trough, an endless belt having transverse ridges carried by said rollers with the upper portion of said belt overlying and supported by the base of said trough and with the edges of the belt in spaced relationship to said side walls of said trough defining spaces therebetween, vacuum channels in the base of said trough and communicating with said spaces between each edge of said belt and the adjoining side wall of said trough which form vacuum ports, a source of vacuum communicating with said channels, a filter cloth overlying and traveling with said belt and completely overlying said vacuum channels whereby said source of vacuum functions to draw liquid through said filter cloth from a slurry containing liquids and solids supported by said filter cloth.

4,351,727

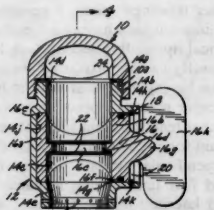
DEVICE FOR REMOVING FOREIGN PARTICLES FROM A SOURCE OF FLUID

Fredric D. Brogger, 613 20th St., Huntington Beach, Calif. 92648

Filed Mar. 23, 1981, Ser. No. 246,478

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—411 **3 Claims**



1. A device for removing foreign particles from a source of fluid comprising in combination,

a cylindrical body formed with a through opening providing an inlet having fastening means for attachment of said body to a faucet and an outlet,

filter means including a member rotatably positioned within an internal arcuate recess of said body between said inlet and outlet for rotation about an axis at substantially right angles to the axis of said through opening,

said rotatable member comprising two spaced arcuate bearing surfaces, a wall aligned with said axis of rotation and formed with an aperture providing a pair of oppositely-facing annular ledges,

said body having two bearing surfaces formed complementally of the bearing surfaces of said rotatable member,

means operable between said rotatable member and said body for retaining the rotatable member in said body,

a substantially flat, co-planar filter screen for each of said ledges and respectively secured thereto in close proximity to said axis of rotation, each of said screens being of predetermined mesh to prevent passage therethrough of foreign particles, and

operating means for said filter means secured to said member and extending externally from said body to enable said filter means to be manually rotated 180 degrees about its axis and said filter screens to be rotated therewith substantially at said axis of rotation.

4,351,728

SEPARATOR FOR CLEANING SUSPENSIONS

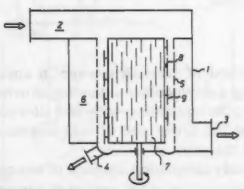
Dieter Egelhof, and Hans R. Schmid, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 171,665

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930475

Int. Cl.³ B01D *29/42;* B07B *1/20*

U.S. Cl. 210—415 **8 Claims**



1. A separator for cleaning suspensions, particularly fibrous suspensions, with a strainer through which the suspension flows, and with a housing which encloses the strainer, the housing having an inlet for the suspension to be cleaned and outlets both for the cleaned suspension and for the impurities held back by the strainer, and with blades revolving in front of the strainer which are divided into part-blades along the axis of rotation and are offset relative to each other in the circumferential direction the strainer being generally symmetric about the axis of rotation, the improvement wherein several rows of part-blades are arranged within the strainer of such a length and staggered over the circumference in such a way that substantially at every height level, relative to the height of the strainer, part-blades from several rows pass by the strainer and wherein in the vicinity of the outlet for the cleansed suspension, shorter part-blades are circumferentially arranged between the part-blades of normal length.

4,351,729

BIOLOGICAL FILTER AND PROCESS

Enrique R. Witt, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

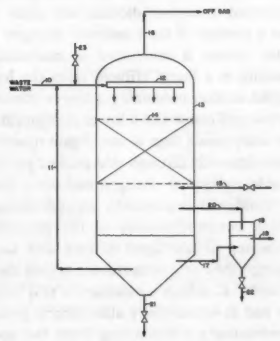
Filed Feb. 6, 1980, Ser. No. 118,935

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—603 **31 Claims**

1. A continuous biological degradation process wherein a liquid waste water stream containing organic pollutants amenable to biological degradation is contacted with a biomass of microorganisms located on the surface of a support packing so as to effect the biological degradation of said organic pollutants to carbon dioxide and other products, said microorganisms being capable of degrading said organic pollutants to carbon dioxide and other products, said process being conducted in the absence of added molecular oxygen, which process comprises:

(a) continuously passing a liquid mixture comprised of said waste water stream and the hereafter defined recycle stream downwardly through a packed section confined within a sealed vessel, said packed section being filled with the said support packing on the surface of which is a said biomass of said microorganisms, said sealed vessel being sealed whereby air and other sources of molecular oxygen cannot enter said sealed vessel, such that said liquid mixture intimately contacts said biomass as its descends through said packed section under conditions whereby at least a portion of the organic pollutants from said waste water stream are biologically degraded and converted to carbon dioxide and other products and resulting in a liquid effluent from the lower end of said packed section containing a lower concentration of said organic pollutants than in said liquid mixture, and whereby liquid descends through said packed section while carbon dioxide and other gases generated in the biological degradation ascend through said packed section countercurrently to the descending liquid, the contacting of said liquid mixture with said biomass being accomplished at a temperature within the range of about 10° to 60° C. which is suitable for said biological degradation and at substantially atmospheric pressure;



(b) continuously withdrawing from the upper end of said sealed vessel at a point above said packed section the said carbon dioxide and other gases generated in the said biological degradation;

(c) continuously withdrawing said liquid effluent from the lower end of said sealed vessel at a point below said packed section, the rate of withdrawal of said liquid effluent being such as to maintain the liquid level of any said liquid effluent accumulating in the bottom of said sealed vessel below said packed section, a portion of said liquid effluent being withdrawn as a treated waste water outfall stream; and

(d) continuously recycling as a said recycle stream a portion of said liquid effluent withdrawn from the lower end of said sealed vessel and mixing said recycle stream with said waste water stream prior to passing the resulting said liquid mixture downwardly through said packed section in accordance with the preceding step (a), the portion of said liquid effluent so recycled as said recycle stream being at least 60% thereof and an amount that, when mixed with said waste water stream, will cause the said liquid mixture to have a concentration of said organic pollutants and of any biostatic or biocidal species to be below that concentration which would inhibit the growth processes of said microorganisms.

20. A continuous biological degradation process wherein a liquid waste water stream containing organic pollutants ame-

nable to biological degradation, and also containing nitrogen compounds wherein combined nitrogen is present as a nitrate, a nitrite or a nitrogen oxide, is contacted with a biomass of microorganisms located on the surface of a support packing so as to effect the biological degradation or conversion of said organic pollutants to carbon dioxide and other products, and to effect the biological degradation or conversion of said combined nitrogen to molecular nitrogen, said microorganisms being capable of degrading said organic pollutants to carbon dioxide and other products and of degrading or converting said combined nitrogen to molecular nitrogen, said process being conducted in the absence of added molecular oxygen, which process comprises:

(a) continuously passing a liquid mixture comprised of said waste water stream and the hereafter defined recycle stream downwardly through a packed section confined within a sealed vessel, said packed section being filled with the said support packing on the surface of which is a said biomass of said microorganisms, said sealed vessel being sealed whereby air and other sources of molecular oxygen cannot enter said sealed vessel, such that said liquid mixture intimately contacts said biomass as it descends through said packed section under conditions whereby at least a portion of the organic pollutants from said waste water stream are biologically degraded and converted to carbon dioxide and other products and at least a portion of the combined nitrogen from said waste water stream is converted to molecular nitrogen and resulting in a liquid effluent from the lower end of said packed section containing a lower concentration of said organic pollutants and a lower concentration of said nitrogen compounds than in said liquid mixture, and whereby liquid descends through said packed section while carbon dioxide, molecular nitrogen and other gases generated in the biological degradation ascend through said packed section countercurrently to the descending liquid, the contacting of said liquid mixture with said biomass being accomplished at a temperature within the range of about 10° to 60° C. which is suitable for said biological degradation and at substantially atmospheric pressure;

(b) continuously withdrawing from the upper end of said sealed vessel at a point above said packed section the said carbon dioxide, molecular nitrogen and other gases generated in the said biological degradation;

(c) continuously withdrawing said liquid effluent from the lower end of said sealed vessel at a point below said packed section, the rate of withdrawal of said liquid effluent being such as to maintain the liquid level of any said liquid effluent accumulating in the bottom of said sealed vessel below said packed section, a portion of said liquid effluent being withdrawn as a treated waste water outfall stream; and

(d) continuously recycling as a said recycle stream a portion of said liquid effluent withdrawn from the lower end of said sealed vessel and mixing said recycle stream with said waste water stream prior to passing the resulting said liquid mixture downwardly through said packed section in accordance with the preceding step (a), the portion of said liquid effluent so recycled as said recycle stream being at least 60% thereof and an amount that, when mixed with said waste water stream, will cause the said liquid mixture to have a concentration of said organic pollutants, and of any said nitrogen compounds, and of any biostatic or biocidal species to be below that concentration which would inhibit the growth processes of said microorganisms.

4,351,730

TREATMENT OF BIOLOGICALLY-DEGRADABLE WASTE

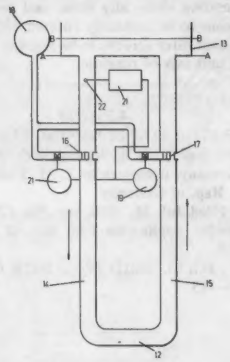
Martin Bailey; David A. Hines; John C. Ousby, and Frank C. Roesler, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 882,224, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 467,511, May 16, 1974, abandoned. This application Dec. 5, 1980, Ser. No. 213,596

Claims priority, application United Kingdom, May 16, 1973, 23328/73; Nov. 2, 1973, 53921/73

Int. Cl.³ C02F *3/22, 3/26*

U.S. Cl. 210—629 **8 Claims**



1. A method of treating sewage in apparatus including a basin having a downcomer extending downwardly therefrom, and a riser communicating with said downcomer both in said basin and at the lower end of said downcomer, said method comprising the steps of

continuously circulating the bulk of sewage contained in the basin-downcomer-riser system at any one time down said downcomer, up said riser, and back down said downcomer until sufficient treatment of the sewage is achieved, said continuous circulation being accomplished by injecting said oxygen-containing gas under pressure into said downcomer below the level of sewage in said basin,

supplying oxygen-containing gas to said downcomer so that said gas flows co-currently with sewage flowing down said downcomer, and upwardly with said sewage in said riser, and

injecting oxygen-containing gas in said riser so that said gas flows co-currently with sewage flowing up said riser, at least 50% of the gas injected into the system being initially injected into the riser when the liquid velocity in the downcomer is less than 1 meter/sec., and at least 50% of the gas injected into the system being injected into the downcomer when the liquid velocity in the downcomer is above 1 meter/sec.

6. Apparatus for sewage treatment comprising

a basin,

a downcomer having an upper opening therefor in communication with said basin and extending downwardly from said basin to a bottom opening,

a riser having a bottom opening thereof in communication with the bottom opening of said downcomer and having an upper opening thereof in communication with said basin, said basin, downcomer, and riser comprising a basin-downcomer-riser system,

means for continuously circulating the bulk of sewage contained in the basin-downcomer-riser system at any one time down said downcomer, up said riser, and back down said downcomer until sufficient treatment of the sewage is achieved,

means for supplying oxygen-containing gas to said down-

comer so that said gas flows co-currently with sewage flowing downwardly in said downcomer, and upwardly with sewage in said riser, and

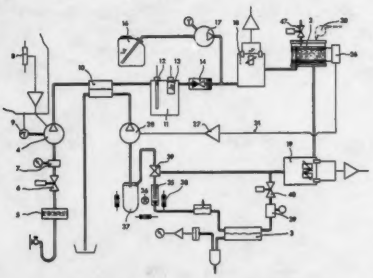
means for injecting oxygen-containing gas in said riser, a source of oxygen-containing gas common to both said downcomer and riser injecting means, and valve means for metering the flow of oxygen-containing gas into said downcomer and said riser so that at least 50% of the total gas injected into the system is injected into the riser when the liquid velocity in the downcomer is less than 1 meter/-second, and at least 50% of the total gas being injected into the system is injected into the downcomer when the liquid velocity in the downcomer is above 1 meter/-second.

4,351,731

PROCESS FOR DIALYZATION OF BLOOD

Erwin Perrot, Schwalbach, Fed. Rep. of Germany, assignor to Klauschenz & Perrot KG, Schwalbach, Fed. Rep. of Germany

Division of Ser. No. 838,389, Sep. 30, 1977, Pat. No. 4,137,168.
This application Dec. 11, 1978, Ser. No. 968,126
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644584
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—647 **10 Claims**



1. In a method for the removal of impurities from a liquid by dialysis, an improved process for controlling the dialysis fluid comprising:

mixing a dialysis fluid concentrate with water to form a dialysis fluid having a preselected concentration;

delivering a predetermined quantity of the mixed dialysis fluid to a storage container per unit of time;

withdrawing the dialysis fluid from the storage container and transporting the fluid through a dialysis chamber wherein impurities are transferred to the fluid from the liquid to be purified through a semi-permeable membrane;

constantly measuring the quantity of the dialysis fluid in the storage container; and

controlling the rate of withdrawal of the dialysis fluid from the storage container in response to the quantity of fluid in the container to maintain a constant quantity in the container.

4,351,732

DEHYDRATION OF ETHANOL

John D. Psaras, Arnold, and James A. Zahniser, Severna Park, both of Md., assignors to The C. M. Kemp Manufacturing Co., Glen Burnie, Md.

Filed Dec. 12, 1980, Ser. No. 215,738
Int. Cl.³ B01D *15/00*; C07C *31/08*
U.S. Cl. 210—689 **8 Claims**

1. A process for dehydrating ethanol to more than 199 proof which comprises:

passing liquid phase ethanol through a desiccant bed adapted to dehydrate 190 proof ethanol to more than 199 proof ethanol until said desiccant bed is substantially fully saturated with adsorbed water and regenerating the desiccant bed for renewed adsorption use according to the following procedure:

heating the bed by indirect heat exchange to above about 212° F. to thereby vaporize absorbed and adsorbed ethanol and water from the bed thereafter;

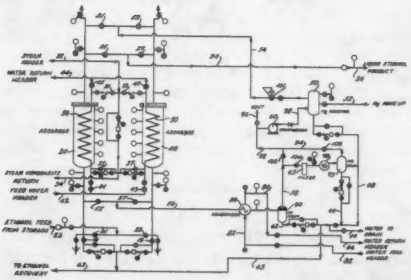
applying sub-atmospheric pressures to the heated bed, desorbing in vapor phase thereby substantial additional proportions of liquid from the bed, and then

cooling the bed by indirect heat exchange to temperature levels suited to adsorption service and releasing the sub-atmospheric pressures thereon.

7. An ethanol dehydration system which comprises an adsorber unit made up of at least two adsorber vessels that alternatively operate through cycles of adsorption and desorption;

each adsorber vessel containing therein a bed of particulate adsorbent and heat exchange means inside said bed adapted to heat and to cool said bed;

means for passing liquid phase ethanol through an adsorber vessel of said adsorber unit during an adsorption cycle to adsorb the water content of the ethanol onto the particulate adsorbent therein;



means for connecting into the hereinafter defined sub-atmospheric pressure inert sweep gas loop an adsorber vessel of said adsorption unit during only the final stages of a desorption cycle to remove vapors evolved from the adsorbent bed therein being regenerated;

means for passing a heating fluid through the heat exchange means in an adsorber vessel from the beginning of the desorption cycle until liquid previously absorbed and adsorbed by the adsorbent bed has been volatilized therefrom thereby regenerating the bed;

a condenser connected to the adsorber vessel undergoing desorption to which the volatilized vapors pass;

means for passing a cooling fluid through the heat exchange means in an adsorber vessel after regeneration of the bed has been completed;

a sub-atmospheric pressure gas loop for inert sweep gas including one of said adsorber vessels, said condenser, a liquid removing means to remove condensate and a compressor, said gas loop serving to circulate sweep gas from the adsorption unit in the final stages of a desorption cycle successively through condenser, liquid removing means, and compressor, then back to the adsorption unit.

4,351,733

PROCESS AND APPARATUS FOR PURIFICATION OF INDUSTRIAL WASTE WATER

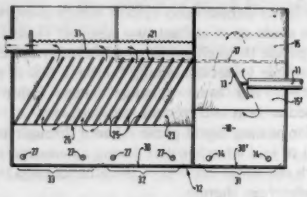
Richard Salzer, Stuttgart, and Hans-Ulrich Schwering, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,214

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043254

Int. Cl.³ B01D *21/10*

U.S. Cl. 210—738 **11 Claims**



1. A process for the purification of industrial waste water containing solid particles comprising introducing said waste water into a settling tank with agitation wherein a portion of the solid particles in said waste water form flocs and settle in the form of sludge and clarified waste water which contains the remainder of said solid particles which overflow the settling tank, dividing said clarified waste water into several streams, conveying each of said several streams to respective lower portions of spaces between the plates of a first inclined plate pack wherein the solid particles coagulate in the space between the plates, and the coagulated particles settle on the plates and slide to the bottom thereof and then into the bottom of a receiving basin and are removed therefrom, and clarified water rises between the plates and is taken off through an overflow at the top.

4,351,734

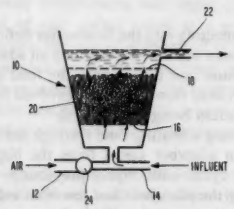
SPARK CELL OZONE GENERATOR

Gilbert Kauffman, Bethlehem, Pa., assignor to Ametek, Inc., Paoli, Pa.

Continuation of Ser. No. 792,543, May 2, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,864

Int. Cl.³ C02F *1/48, 1/78*

U.S. Cl. 210—748 **11 Claims**



1. In an apparatus having a chamber with an inlet and outlet for treating liquids with ozone, the improvement which comprises electrode means vertically spaced and horizontally disposed within said chamber,

an expandable bed of electrically conductive particles disposed substantially throughout the space between said electrode means,

said electrically conductive particles forming tortuous paths throughout,

said fluid inlet means being located at the bottom portion of said chamber and said fluid outlet means being located at the top portion of said chamber for passage of the liquid upward through said chamber, said particles and said outlet,

means for applying an electrical potential between said electrodes and for producing arcing in air spaces between said particles, and

means for passing air upwardly through said particles along with said fluid in a manner adapted to expand said particle bed and thereby establish intermittent electrical contact between said electrodes and to cause arcing in air spaces between particles thereby to form ozone.

6. A method of treating a liquid with ozone which comprises:

(a) passing the liquid to be treated upwardly between complementary spaced horizontal electrodes having therebetween an expandable bed of electrically conductive particles,

(b) simultaneously passing pulses of air upwardly with said liquid through said bed, said pulsed air forming bubbles in said liquid,

(c) establishing between said electrodes an electrical potential, said upwardly flowing liquid and pulsed air expanding said bed upwardly in a pulsed manner causing intermittent contact between the particles of said bed and said electrodes, said electrical potential being sufficient to create arcing between said particles and across said air bubbles and thereby converting oxygen to ozone therein, said ozone thus being dispersed as it is formed throughout said liquid to effect treatment thereof.

4,351,735

MINERAL ENRICHMENT COMPOSITION AND METHOD OF PREPARING SAME

Bruce D. Buddemeyer; William A. Neville; Nancy A. Rozzo, and Richard G. Bourne, all of Kansas City, Mo., assignors to R.G.B. Laboratories Inc., Kansas City, Mo.

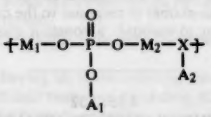
Continuation-in-part of Ser. No. 970,935, Dec. 19, 1978, Pat. No. 4,214,996. This application Jul. 7, 1980, Ser. No. 166,460

The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.

Int. Cl.³ A23L *1/30*

U.S. Cl. 252—1 **34 Claims**

1. A composition of matter which includes a moiety of the generalized formula



wherein

M_1 and M_2 are polyvalent and respectively taken from the group consisting of arsenic, silver, aluminum, barium, bismuth, mercury, lead, antimony, tin, beryllium, cadmium, cobalt, chromium, selenium, silicon, strontium, titanium and vanadium,

A_1 and A_2 are respectively taken from the group consisting of hydrogen, ammonium and the alkali metals, and

X is an organic acid moiety having at least three carboxyl groups therein.

4,351,736

PILE-STABILIZING SILICON-CONTAINING TEXTILE AGENTS

Helmut Steinberger, Leverkusen; Hans-Heinrich Moretto, Cologne; Wilfried Kortmann, Hagen, and Josef Pfeiffer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,444

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004824

Int. Cl.³ D06M *15/00*; C08L *83/06*

U.S. Cl. 252—8.6 9 Claims

1. A textile pile-stabilizing impregnating agent comprising a colloidal suspension of a silicic acid and organosilsequioxanes having units of the formula $RSiO_{3/2}$ wherein R is an alkyl or aryl radical with up to 7 carbon atoms.

4,351,737

FABRIC SOFTENER CONCENTRATE

Siegfried Billenstein, Burgkirchen; Adolf May, Hofheim am Taunus, and Hans-Walter Bücking, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,909

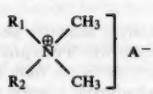
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025369

Int. Cl.³ D06M *13/40, 13/46*

U.S. Cl. 252—8.8 2 Claims

1. Fabric softener concentrates, which contain from:

(a) 30 to 70 weight % of a cationic softener of the formulae:



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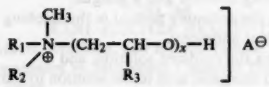
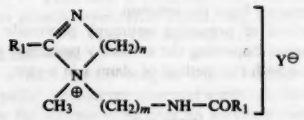


II



III

the symbols in the above formulae having the following meanings:

R_1 and R_2 each denotes alkyl or alkenyl of from 8 to 20 carbon atoms,

R_3 is hydrogen or alkyl of from 1 to 3 carbon atoms,

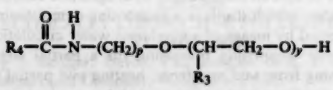
x is an integer of from 1 to 5,

m and n each is 2 or 3,

A^- is chlorine or bromine, and

Y^- is methosulfate;

(b) 5 to 50 weight % of a non-ionic softener of the formula:



IV

wherein

R_4 is alkyl or alkenyl of from 8 to 22 carbon atoms,

R_3 is hydrogen or alkyl of from 1 to 3 carbon atoms,

p is an integer of from 1 to 5 and Y is an integer of from 1 to 15,

(c) 5 to 20 weight % of an oxethylated alkyl phenol or fatty alcohol,

(d) 5 to 30 weight % of a C_1–C_3alkanol,

(e) 5 to 30 weight % of butyl diglycol, ethylene glycol or 1,2-propanediol and

(f) water and optionally perfume and dyestuffs in quantities representing the remainder to 100 weight %.

4,351,738

YARN TREATING COMPOSITION FOR HIGH-SPEED FRICTION DRAW-FALSE TWIST TEXTURING AND A FILAMENTARY YARN TREATED WITH THE SAME

Masao Takahashi, Mihara; Katumi Yoshida; Shinji Ohwaki, both of Matsuyama, and Hiroyuki Moriga, Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 21, 1980, Ser. No. 180,177

Claims priority, application Japan, Aug. 21, 1979, 54-105467

Int. Cl.³ D06M *15/10, 15/68*

U.S. Cl. 252—8.75 6 Claims

1. A yarn treating composition for high-speed friction draw-false twist texturing comprising substantially (A) a polyether lubricant component and (B) an anionic component, wherein (A) said polyether lubricant component consists of one or two or more types of random or block copolymers having a molar copolymerization ratio between propylene and ethylene oxides of 35:65–90:10, and an average molecular weight in the range of 1,000 to 15,000, both inclusive, and is incorporated in the composition in an amount of 96% by weight or more, and (B) said anionic component is a mixture (C) of compounds I and II, I and III, or I, II and III, said compounds being defined below and said mixture being incorporated in the composition in amounts ranging from 0.5% to 4.0% by weight, said compound I being selected from the following groups (b-1), (b-2) and (b-3):

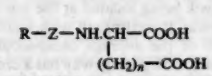
(b-1): alkali metal, ammonium, organic amine salts or their mixtures of long-chain monoolefinic dicarboxylic acids, obtained by addition of long-chain monoolefin having 8 to 18 carbon atoms with at least one of dicarboxylic acids having double bonds, anhydrides thereof and ester derivatives thereof, each having at least one carboxyl group in the molecule, obtained by reacting said long-chain monoolefinic dicarboxylic acids or the corresponding dicarboxylic acid anhydrides with compounds having one or more hydroxyl groups in the molecule,

(b-2): selected from (a), (b) or a mixture of (a) and (b), wherein (a) and (b) are:

(a) alkali metal, ammonium or organic amine salts of dicarboxylic derivatives having long-chain alkyl ethers, long-chain alkyl thioethers or long-chain alkyl ketone groups, obtained by reacting dicarboxylic acids having double bonds, anhydrides, or diesters thereof, with compounds having active hydrogen atoms selected from the group consisting of aliphatic alcohols, aliphatic alkyl mercaptans, and aliphatic aldehydes having 8 to 18 carbon atoms on the average;

(b) alkali metal, ammonium or organic amine salts of ester commpounds having at least one carboxyl group, obtained by reacting said dicarboxylic derivatives having long-chain alkyl ethers, long-chain thioethers or long-chain alkyl ketone groups with compounds each having at least one hydroxyl group in the molecule,

(b-3): alkali metal, ammonium, alkanolamine or alkylamine salts of compounds of the general formula



where R is an alkyl, alkenyl, or fluoroalkyl group having 8 to 22 carbon atoms; n is a positive integer 1 or 2; Z is —CO— or —SO_2—, obtained by reacting amino-dicar-

boxylic acids or derivatives thereof with at least one of aliphatic acyl halides, sulfo-chlorides, and alkali metal, ammonium or organic amine salts of ester compounds each having at least one carboxylic group, obtained from esterification of said compounds defined above or anhydrides thereof with compounds having at least one hydroxyl group in the molecule;

compounds (II): alkali metal, ammonium or organic amine salts of phosphates having higher alkyl or aralkyl polyoxyalkylene ether groups; and

compounds (III): amine, organic amine or alkali metal salts of sulfonate compounds each having at least one alkyl group and sulfonic acid group respectively in the molecule.

4,351,739

SOUND ABSORBENT PANEL

Ingo Romey, Hüenxe, and Willi Trojan, Aachen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 6, 1979, Ser. No. 72,921

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2838944

Int. Cl.³ C04B *43/00*

U.S. Cl. 252—62 **3 Claims**

1. A composition for a sound absorbent panel, comprising a mixture of 70 to 97 weight percent of carbon-containing material which is obtained by destillation or filtration as residue of the product of a coai hydrogenation process and/or pitch filtration and having a carbon content of about 50–60% and comprising an inorganic material at least one of the group of minerals, catalysts for coal-hydrogenation and inorganic filtering auxiliaries, with 3–30 weight percent of a binder of thermosetting or thermoplastic material.

4,351,740

BOTTLED PARTICULATE DETERGENT

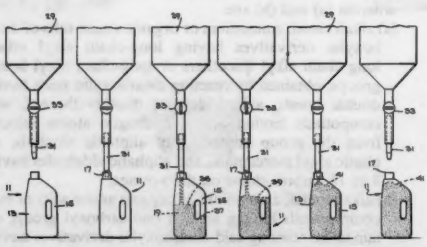
David Joshi, Piscataway, N.J., and Richard Klingaman, Houston, Tex., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 964,037, Dec. 21, 1979, Pat. No. 4,269,722. This application Jul. 23, 1980, Ser. No. 171,325

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ B65B *1/06*; C11D *17/06*

U.S. Cl. 252—90 **10 Claims**



1. A bottled particulate laundry detergent which comprises a transparent bottle having a neck portion for dispensing detergent from the bottle, the bottle being made of a thin-walled synthetic organic polymeric plastic which is essentially moisture proof, the neck being located at the top of the bottle and having a passageway therethrough with a cross-sectional area of less than 40% of the average cross-sectional area of the bottle, wherein said neck passageway has a cross-sectional area of about from 2 to 40 sq. cm., the bottle being provided further with an integral hollow handle located on the side of the bottle, wherein the interior of said handle communicates with other interior portions of the bottle, and said handle has an internal cross-sectional area in the range of about 1 to 10 sq. cm., said neck being located nearer the side of the bottle opposite that of the handle and a free-flowing particulate detergent in said bottle, pourable through said neck and handle, the composition of which comprises from about 2 to 50% by weight of a synthetic organic detergent selected from the group consisting of nonionic detergents and mixtures of said nonionic detergents with anionic detergents, wherein said nonionic detergent is a normally tacky ethoxylated detergent, and from about 50 to 90% by weight of builders for said detergent, wherein said builders are selected from the group consisting of ion exchanging clays, organic builders and sodium salts of at least one of bicarbonates, borates, carbonates, phosphates, and silicates, said particles sized such that at least 90% thereof pass through an 8 mesh screen and are retained on a 200 mesh screen (U.S. Sieve Series), are of a bulk density of at least 0.5 g/cc., are of a flowability sufficiently high so that said particulate detergent flows through the neck and handle of said bottle and are substantially dust-free so that after pouring some of said composition from said bottle the bottle and the contained volume above the level of the particulate detergent return to a transparent condition, and a resealable cap for said neck portion.

4,351,741

METHOD OF PREPARING ANTIMONY PENTOXIDE, COLLOIDS THEREOF AND THEIR PREPARATION

John W. Vogt, Chagrin Falls, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Feb. 5, 1979, Ser. No. 9,032

The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.³ B01J *13/00*; C01G *30/00*

U.S. Cl. 252—313 R **16 Claims**

1. A method of preparing antimony pentoxide from antimony sulfide-bearing solids which comprises the steps of

(a) leaching the antimony values from the solids with an aqueous potassium hydroxide solution to form an antimony-containing solution and a gangue,

(b) oxidizing the antimony present in the leaching solution to a pentavalent antimony,

(c) recovering the oxidized solution, and

(d) adding an inorganic acid to the solution to reduce the pH of the solution to about 5–7 whereby antimony pentoxide is precipitated from the solution.

15. A method of preparing antimony pentoxide colloids which comprises dispersing the antimony pentoxide prepared in accordance with the method of claim 1 in water.

4,351,742

METHOD FOR THE PRODUCTION OF SYNTHESIS GAS

Norbert Deuser, and Peter Diemer, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,903

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016876

Int. Cl.³ C01B *3/16, 3/38*

U.S. Cl. 252—373 **6 Claims**

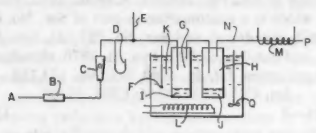
1. In a method for the production of synthesis gas, in which the crude gas obtained through partial oxidation of carbon-containing material is subjected to a catalytic conversion in a conversion of carbon monoxide to hydrogen and carbon dioxide apparatus, which displays a moistening-demoistening system connected by means of a combined water circulation, the improvement comprising branching off a partial stream of water coming from said moistener, heating said partial stream of water by indirect heat exchange with hot product produced from the subsequent reaction of said synthesis gas, and then uniting this heated water with the partial stream of water coming from the demoistener for re-delivery to the moistener.

4,351,743

DILUTE STANDARD GASES PREPARED BY UTILIZING BUFFERED SOLUTION, METHOD FOR PREPARATION THEREOF AND APPARATUS THEREFOR

Yoshikazu Hashimoto, 7-3-14, Minamiaoyama, Minato-ku, Tokyo, Japan

Filed Mar. 31, 1977, Ser. No. 783,458
Claims priority, application Japan, Apr. 7, 1976, 51-38149
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—408 **3 Claims**



1. A method for generating a dilute standard gas selected from the group consisting of nitrogen oxides, sulfur oxides, hydrogen sulfide, hydrogen cyanide and formaldehyde at a substantially constant rate which comprises:

(a) preparing a solution containing a compound capable of generating said gas;

(b) adjusting the pH of said solution with a buffer, in a gas generating chamber having gas introduction and exit tubes disposed above said solution, to generate gas into the vapor phase above said solution;

(c) passing a flow of air into said gas generating chamber through said gas introduction tube and removing dilute standard gas through said exit tube,

said gas generating chamber being maintained at a substantially constant temperature throughout said gas generation, whereby said gas is generated at a substantially constant rate and is taken up by said flow of air at a substantially constant rate.

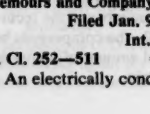
4,351,744

KARL-FISCHER REAGENT

Kaname Muroi, Machida, and Hiroko Fujino, Yamato, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,880
Claims priority, application Japan, Oct. 31, 1979, 54-140946
Int. Cl.³ G01N *33/18*
U.S. Cl. 252—408 **7 Claims**

1. In a Karl-Fischer reagent which consists essentially of iodine, sulfur dioxide, pyridine and a solvent, the improvement wherein the solvent comprises an alkylene carbonate of the formula:



wherein R represents a hydrogen atom or a lower alkyl group.

4,351,745

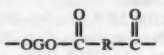
ELECTRICALLY CONDUCTIVE POLYETHEREST ER ELASTOMERS

Henry J. Stinger, Devon, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

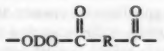
Filed Jan. 9, 1980, Ser. No. 110,775
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **10 Claims**

1. An electrically conductive composition, capable of forming self-supporting films, consisting essentially of a uniform mixture of:

(A) 100 parts of a copolyetherester having a melting point of at least about 90° C. and containing 45–85 weight percent of long-chain ester units represented by the following formula (1)



and 15–55 weight percent of short-chain ester units represented by the following formula (2)



wherein

R is a divalent radical remaining after removal of carboxyl groups from an aromatic or aliphatic dicarboxylic acid having a molecular weight of less than 300;

G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol HO-G-OH having a number average molecular weight of about 600–3500 and a carbon/oxygen atomic ratio of at least 2.5; and

D is a divalent radical remaining after removal of hydroxyl groups from a diol HO-D-OH having a molecular weight of less than about 250; and

(B) 60–110 parts of a conductive filler selected from the group consisting of carbon black and a mixture of carbon black and graphite, the proportion of carbon black in such a mixture being no less than about 20 weight percent;

the resistivity of said electrically conductive composition being less than about 2 ohm.cm, its tensile strength at break at least about 10 MPa, and its extension at break at least 20%.

4,351,746

COMPOUND DISPERSIONS AND FILMS

Darrell J. Parish, Stoutsville, Ohio, and Robert S. Mallouk, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1980, Ser. No. 172,998
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **11 Claims**

1. A compound dispersion comprising:

(i) electrically conductive carbon particles 0.01 to 20 microns in average diameter;

(ii) a polyolefin having the carbon particles evenly distributed therein to yield a primary dispersion of about 25 to 75 weight percent carbon particles and the remainder polyolefin; and

(iii) a polyester made from dicarboxylic acids or esterforming derivatives thereof and glycols and substantially immiscible with the polyolefin of the primary dispersion, containing less than about 5 weight percent of the carbon particles, and having the primary dispersion evenly distributed therein to yield the compound dispersion of about 5 to 20 weight percent primary dispersion and the remainder polyester.

4,351,747

INFORMATION SIGNAL RECORD MEDIUM OF THE CAPACITANCE TYPE

Kazumichi Miyamoto, Ichikawa; Akira Nishizawa; Takao Okuda, both of Yokohama; Mamoru Nakamura, Takaoka, and Takaharu Abe, Atsugi, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo and Victor Company of Japan Limited, Kanagawa, both of, Japan

Filed Oct. 28, 1980, Ser. No. 201,592

Claims priority, application Japan, Oct. 29, 1979, 54/139705

Int. Cl.³ H01B 1/06

U.S. Cl. 252—511 **15 Claims**

1. In an information signal record medium of the capacitance type wherein an information signal is recorded as a variation in the geometrical shape of its surface area, and is played back by the variation of the capacitance between its surface and an electrode of a reproducing stylus scanning the surface of the record medium relatively which occurs according to a variation in the geometrical shape of its surface area, the improvement wherein at least the surface area of the record medium is formed of a material composed of an electrically conductive substance and a copolymer consisting of 98 to 65% by weight of vinyl chloride, 2 to 20% by weight of an alkyl vinyl ether with the alkyl group having 4 to 18 carbon atoms and/or a vinyl ester of a fatty acid in which the fatty acid residue has 4 to 18 carbon atoms and 0 to 15% by weight of another monomer copolymerizable with these compounds.

4,351,748

NORBORNANE (-ENE) DERIVATIVES AND THEIR USE AS PERFUMING INGREDIENTS

Francois Delay, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

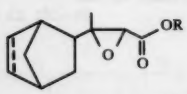
Division of Ser. No. 28,843, Apr. 10, 1979, Pat. No. 4,252,728. This application Feb. 5, 1981, Ser. No. 231,852

Claims priority, application Switzerland, Apr. 17, 1978, 4073/78

Int. Cl.³ A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R **7 Claims**

1. A process for imparting, modifying or enhancing the odoriferous properties of perfumes and perfumed articles which comprises the step of adding thereto a perfuming effective amount of a compound of formula



wherein a solid line represents a single bond in the chain and the combination of a solid line and a dotted line represents a double bond in the chain and symbol R represents a lower alkyl radical having 1 to 4 carbon atoms.

4,351,749

MOLECULAR GLASSES FOR NUCLEAR WASTE ENCAPSULATION

Richard C. Ropp, Warren, N.J., assignor to Vitrex Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 964,120, Nov. 28, 1978, abandoned. This application May 5, 1980, Ser. No. 146,302

Int. Cl.³ G21F 9/16

U.S. Cl. 252—629 **62 Claims**

1. A nuclear waste block for storage of high level radioactive waste, said block comprising, in combination: about 4 to 47 parts by weight of solid radioactive waste material dispersed in 96 to 53 parts by weight, respectively, of a polymeric phosphate glass having the formula:

$$M_3P_7O_{22},$$

where M is a trivalent metal selected from the group consisting of aluminum, indium and gallium.

4,351,750

QUICK-SETTING BITUMINOUS EMULSION COMPOSITIONS

Richard L. Ferm, Lafayette, and Chester C. Latif, Turlock, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 16,653, Mar. 1, 1979, abandoned, which is a division of Ser. No. 255,604, May 22, 1972, Pat. No. 4,193,816, which is a continuation-in-part of Ser. No. 672,746, Oct. 4, 1967, abandoned, and Ser. No. 757,137, Sep. 3, 1968, abandoned, and Ser. No. 68,502, Aug. 31, 1970, abandoned. This application Jul. 28, 1980, Ser. No. 173,232

Int. Cl.³ C04B 7/356; C08L 95/00

U.S. Cl. 524—8 **13 Claims**

1. A surfacing composition which rapidly sets to a tough cohesive surface with early development of tensile strength and rain resistance and is prepared by intimately mixing a solid particulate matter, a bituminous emulsion having a pH greater than about 7, and a set initiator in the following proportions: which comprises 100 parts by weight of a solid particulate matter, 0.1 to less than 5 parts by weight of a set initiator which is Portland cement, hydrated lime, or mixtures thereof; and from about 3 to 150 parts of a bituminous emulsion comprising from about 50 to 70 weight percent of a bituminous binder and from about 0.1 to about 3 weight percent of the anionic ammonium or alkali metal emulsifying salt of a compound selected from the group consisting of a hydrocarbyl phosphoric acid, a hydrocarbyl phosphonic acid and mixtures thereof, wherein the hydrocarbyl moiety is from about 8 to 22 carbon atoms.

4,351,751

GLASS FIBER REINFORCED POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Kazuo Kishida; Isao Sasaki, and Hiroshi Mori, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 217,095

Claims priority, application Japan, Dec. 27, 1979, 54-173011; Aug. 19, 1980, 55-113595

Int. Cl.³ C08L 91/08, 67/02

U.S. Cl. 524—375 **17 Claims**

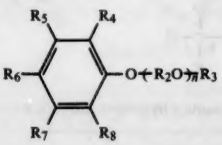
1. A reinforced resin composition exhibiting good heat resistance and appearance, which consists essentially of:

(A) at least 30% by weight of a polyethylene terephthalate resin;

(B) about 5 to about 60% by weight of glass fiber;

(C) about 0.03 to about 5% by weight of at least one organic carboxylic acid salt of a metal of Groups I-a or II-a of the Periodic Table; and

(D) about 0.1 to about 20% by weight of at least one ether compound of the formula:



wherein R_3 is hydrogen or a hydrocarbon group having from 3 to 30 carbon atoms, R_2 is an alkylene group having 2 to 6 carbon atoms, R_4 through R_8 are independently hydrogen or a hydrocarbon group having from 1 to 9 carbon atoms, and n is an average number of the recurring units in the range of from 5 to 200, the components being admixed together so that the total amount of components (A) through (D) is 100% by weight.

4,351,752

DETACKIFIED AQUEOUS SIZING COMPOSITION COMPRISING LIQUID POLYMER AND FREE RADICAL GENERATOR

Balbhadra Das, Allison Park, Pa., and Dennis M. Fahey, Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1979, Ser. No. 49,841
Int. Cl.³ C08L *91/00;* D02G *3/00*
U.S. Cl. 523—401 **6 Claims**

1. An aqueous sizing composition for treating glass fibers to yield a sized glass fiber strand having reduced tackiness, comprising:

(a) one or more low molecular weight liquid polymers selected from the group consisting of styrene-butadiene copolymers, acrylonitrile-butadiene copolymers, hydroxy or carboxy terminated derivatives of these copolymers; 1,2-epoxy polymers having unsaturation or a replaceable hydrogen in the polymer backbone or at a pendant position; unsaturated polyester polymers prepared from at least one polyhydric alcohol and polycarboxylic acid or anhydride; and liquid polyurethane polymers produced from isocyanates and polyols and where the liquid polymer is curable with free radical generators; and

(b) a free radical generator selected from the group consisting of peroxides and hydroperoxides in an amount in the range of about 0.2 to about 5 parts per 100 parts of liquid polymer, and

(c) water.

4,351,753

LIQUIFIED NORMALLY SOLID POLYOXYALKYLENE BLOCK COPOLYMERS

Thomas M. Kaneko, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 24, 1980, Ser. No. 200,118
Int. Cl.³ C08L *63/00*
U.S. Cl. 252—357 **18 Claims**

1. A liquid composition consisting essentially of a normally solid nonionic polyoxyalkylene block copolymer and ethylene glycol.

4,351,754

THICKENING AGENT FOR AQUEOUS COMPOSITIONS

Jean Dupre, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 75,860, Sep. 17, 1979, abandoned. This application Apr. 10, 1980, Ser. No. 139,053
Int. Cl.³ C08K *3/36*
U.S. Cl. 524—445 **11 Claims**

1. As a thickening agent for aqueous systems, a composition comprising a mixture of:

(A) a water swellable clay mineral, and

(B) a water insoluble emulsion polymer, an aqueous dispersion of which will thicken upon addition of a neutralization agent, of

(1) 20–50 wt. % of (meth)acrylic acid,

(2) 0.5–25 wt. % of at least one monomer of the formula (I):

$$H_2C{=}C(R){-}C(O){-}O{-}(CH_2CH_2O)_n{-}R^o$$

wherein R is H or CH_3, n is at least 2 and has an average value up to 60 or more, and R^o is a group having at least 8 carbon atoms selected from alkyl, alkaryl and polycyclic hydrocarbyl,

(3) at least 30 wt. % of an alkyl (meth)acrylate wherein the alkyl group has 1 to 4 carbon atoms, and

(4) zero to 1.0 wt. % of a polyethylenically unsaturated monomer;

the proportions of (A) and (B) being effective, upon addition of a neutralizing agent for (B), for thickening an aqueous dispersion formed therewith.

4,351,755

ISOCYANATE-FUNCTIONAL POLYMERS CONTAINING A TERMINAL MONOSULFIDE GROUP

Darryl W. Brixius, Allentown, Pa., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

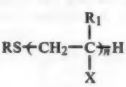
Continuation-in-part of Ser. No. 53,301, Jun. 29, 1979, abandoned, which is a division of Ser. No. 819,121, Jul. 26, 1977, abandoned. This application Oct. 8, 1980, Ser. No. 195,081
Int. Cl.³ C08K *5/10;* C08F *26/02;* B32B *17/10*
U.S. Cl. 524—555 **32 Claims**

1. An isocyanate-functional polymer of at least 10% by weight of isocyanatoalkyl acrylate or isocyanatoalkyl methacrylate, polymerized alone or with a polymerizable comonomer,

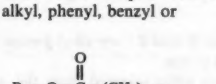
any polymerizable comonomer being at least one member of the group consisting of alkyl acrylates and methacrylates; styrene; ethylene; vinyl acetate; and vinyl chloride,

in the presence of 1–20% by weight, based on the weight of the polymer, of a mercaptan chain-transfer agent,

wherein at least 10% by number of the polymer molecules have the following structure:



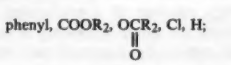
where RS is the residue of a mercaptan chain-transfer agent, R— being C_4–C_{12} alkyl, phenyl, benzyl or



where R_3— is C_4–C_{12} alkyl, phenyl or benzyl and m is 0–8;

R_1 is hydrogen or methyl;

X is COO—A—NCO or a mixture of COO—A—NCO and at least one of



where

A is an alkylene group having 2–6 carbon atoms, and

R_2 is an alkyl group having 1–12 carbon atoms;

and n is 2–400 so that the polymer has a number average molecular weight, determined by gel permeation chromatography, utilizing polystyrene standards of polydispersity less than 1.1, of 500–10,000.

4. A coating composition comprising a solution of a polymer of claim 1 in an organic solvent.

4,351,756

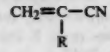
RUBBER-MODIFIED HIGH NITRILE COPOLYMERS WITH IMPROVED IMPACT RESISTANCE

Dorothy C. Prem, Sagamore Hills Township, Summit County; June T. Duke, Chagrin Falls, and Ralph E. Isley, Northfield, all of Ohio, assignors to SOHIO, Cleveland, Ohio

Continuation-in-part of Ser. No. 968,937, Nov. 16, 1978, Pat. No. 4,244,852. This application Jun. 2, 1980, Ser. No. 155,725
The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.
Int. Cl.³ C08F *2/16;* C08K *5/12*
U.S. Cl. 524—314 **9 Claims**

1. The process for preparing a resin having good impact resistance comprising polymerization in an aqueous medium at a temperature in the range of from 0° to 100° C. in the substantial absence of molecular oxygen 100 parts by weight of

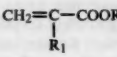
(A) from 60 to 90% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 40% by weight based on the combined weights of (A) and (B) of at least one member selected from the group consisting of

(1) an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(2) an alpha-olefin having the structure

wherein R' and R'' are alkyl groups having from 1 to 7 carbon atoms,

(3) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

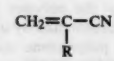
(4) vinyl acetate,

(5) styrene, and

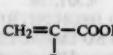
(6) indene,

in the presence of from 1 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene, a nitrile monomer having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of polymerized comonomer, said (C) having been prepared by carrying out the polymerization of the monomers in the presence of from 5 to 50 parts by weight per 100 parts of monomer of a plasticizer having the structure R^{III}—$COOR^{IV})_2$ wherein R^{III} is an aliphatic hydrocarbon diradical having 4 carbon atoms and R^{IV} is an aliphatic hydrocarbon group having from 1 to 12 carbon atoms or an aliphatic hydrocarbon ether group having from 2 to 12 carbon atoms.

4,351,757

MOLDING MATERIAL OF POLYETHYLENE TEREPHTHALATE AND ALKAI METAL SALT OF C_{30}–C_{54} SUBSTANTIALLY ALIPHATIC CARBOXYLIC ACID

Guenther K. Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 24, 1980, Ser. No. 200,192
Int. Cl.³ C08K 5/10; C08L 67/02
U.S. Cl. 524—169 8 Claims

1. A polyethylene terephthalate molding blend consisting essentially of:

(a) polyethylene terephthalate which can contain up to 10% by weight of a nonpolymeric comonomer or up to 3% by weight of a polymeric comonomer, and which has an inherent viscosity of at least 0.4 dl/g; and

(b) about 0.1–5% based on polyethylene terephthalate, of an alkali metal salt of a substantially aliphatic polycarboxylic acid containing between 30 and 54 carbon atoms and 2 to 4 carboxyl groups and having a molecular weight of less than about 1500, provided the amount of salt present is sufficient to provide a $\Delta H_H/\Delta H_c$ ratio of less than 0.25 to the blend.

4,351,758

POLYESTER BLENDS

Shau-Zou Lu, Whitehouse Station, and Melvin Druin, West Orange, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 6, 1980, Ser. No. 175,564
Int. Cl.³ C08L 67/02
U.S. Cl. 524—227 33 Claims

1. A process for the production of a resin molding composition which comprises intimately admixing

(a) a resin blend of polyethylene terephthalate and polybutylene terephthalate in a weight ratio in the range of between about 1:1 and 9:1 respectively, said blend being present in the range of between about 40 and 95 percent by weight based on the total weight of the composition;

(b) an additive, selected from the group consisting of reinforcing agents; mineral fillers; and blends of reinforcing agents and mineral fillers; said additive being present in the range of from about 4 and 65 percent by weight based on the total weight of the composition; and

(c) a nucleating agent, selected from the group consisting of an alkali metal salt having anions which are oxides of the elements of group IV of the Periodic Table; talc; and barium sulfate, said nucleating agent present in the range of from about 0.1 and 20 percent by weight based on the total weight of the composition;

said composition having a moisture content in the range of from about 0.05 and 0.68 weight percent based on the total weight of said resin blend.

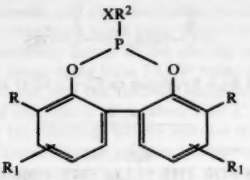
4,351,759

ALKYLATED 2,2'-BIPHENYLENE PHOSPHITES AND STABILIZED COMPOSITIONS

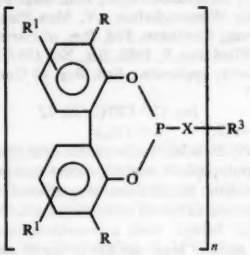
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 93,786, Nov. 13, 1979, Pat. No. 4,288,391, which is a continuation-in-part of Ser. No. 866,748, Jan. 3, 1978, Pat. No. 4,196,117. This application Mar. 23, 1981, Ser. No. 246,341
Int. Cl.³ C08K 5/52
U.S. Cl. 524—100 12 Claims

1. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with from about 0.01 to about 5% by weight, of the total composition, of a 1,1'-biphenyl-2,2'-diyl phosphite of the formula



or



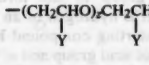
wherein

R is an alkyl group of 1 to 18 carbon atoms,

R^1 is hydrogen or alkyl group of 1 to 18 carbon atoms, and

R^2 is an alkyl group of 1 to 20 carbon atoms, phenyl, phenyl substituted by 1 to 3 alkyl groups each having 1 to 8 carbon atoms, or by two alkyl groups each having 1 to 8 carbon atoms and by —$COOR^4$ where R^4 is alkyl of 1 to 18 carbon atoms,

R^3 is an n-valent radical selected from the group consisting of a straight- or branched-chain alkylene of 2 to 12 carbon atoms, a straight- or branched chain alkane-triyl, -tetrayl, -pentayl or -hexayl of 3 to 6 carbon atoms, alkenylene of 4 to 6 carbon atoms, cycloalkylene of 6 to 12 carbon atoms, 1,4-cyclohexanedimethylene, arylene or arenetriyl of 6 to 10 carbon atoms, p-xylylene, phenylene-E-phenylene where E is a direct bond, —O—, —S—, —NR^5—, where R^5 is alkyl of 1 to 18 carbon atoms; a straight- or branched chain alkylene or alkylidene of 1 to 12 carbon atoms or cycloalkylidene of 5 to 6 carbon atoms, said arylene or said phenylene-E-phenylene substituted by 1 to 4 alkyl groups each having 1 to 8 carbon atoms, $—(CH_2)_xX(CH_2)_x—$ where x is 2 to 6, dipentaerythrityl, and



where Y is hydrogen, methyl or ethyl and z is 1 to 10, X is oxygen or sulfur, and n is 2 to 6.

4,351,760

NOVEL ALKYL SUBSTITUTED FLUORESCENT COMPOUNDS AND POLYAMINO ACID CONJUGATES

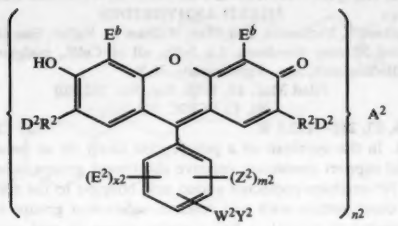
Pyare Khanna, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Sep. 7, 1979, Ser. No. 73,158

Int. Cl.³ A61K *39/385, 39/44;* **C07G** *7/00*

U.S. Cl. 260—112 R **7 Claims**

1. A compound of the formula:



wherein:

E^b is hydrogen or chloro;

E^2 is chloro;

Z^2 is carboxy;

R^2 is alkylene of from 1 to 3 carbon atoms;

D^2 is hydrogen or carboxy;

W^2 is a bond, alkylene, carboxamidoalkylene, or poly(carboxamidoalkylene), wherein alkylene is of from 1 to 2 carbon atoms;

Y^2 is non-oxo-carbonyl, carbamoyl, thiocarbamoyl, amino, methylene, oxy or thio;

A^2 is a poly(amino acid) ligand or receptor;

m^2 is 0 to 3;

x^2 is 0 to 4; and

n^2 is 1 to the molecular weight of A^2 divided by 500.

4,351,761

PURIFIED ANTIGEN TO TEST FOR *NEISSERIA GONORRHOEAE* ANTIBODIES

Hassan A. Gaafar, Voorheesville, N.Y., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 46,639, Jun. 8, 1979, abandoned, which is a continuation of Ser. No. 905,954, May 15, 1978, Pat. No. 4,241,045. This application Feb. 5, 1981, Ser. No. 231,891

Int. Cl.³ A61K *35/74, 39/095, 39/385, 39/40*

U.S. Cl. 260—112 R **12 Claims**

1. A heat stabile antigen preparation, protein in nature isolated from *Neisseria gonorrhoeae* and useful for detecting the presence of *Neisseria gonorrhoeae* antibodies in human serum, containing a heat stable, species specific L-antigen which is characterized as follows:

1. stable in boiling water for a period of one hour,
2. stable in an aqueous medium at pH values of 3-11,
3. stable when incubated with the following enzymes:
   DNA-ase
   RNA-ase
   dextranase
   neuraminidase
   lysosyme,
4. isoelectric point of 4±0.2,
5. molecular weight subunits of 37,000–40,000 as determined by ADS-polyacrylamide gel,
6. contains 2–3% organic phosphorus,
7. soluble in water, and more soluble in aqueous media containing surface active agents; insoluble methanol, chloroform and acetone,
8. reacts specifically with antibodies produced in rabbits against purified L-antigen, and
9. partially soluble in 5% to 10% trichloroacetic acid,
10. contains less than 1% carbohydrate,
11. inactivated when incubated with trypsin.

4,351,762

RAPID, QUANTITATIVE PEPTIDE SYNTHESIS USING MIXED ANHYDRIDES

Michael S. Verlander, Del Mar; William D. Fuller, San Diego, and Murray Goodman, La Jolla, all of Calif., assignors to BioResearch, Inc., Farmingdale, N.Y.

Filed Mar. 10, 1981, Ser. No. 242,310
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 10 Claims

1. In the synthesis of a polypeptide chain on an insoluble solid support containing reactive substituent groups, wherein an N^{α}-urethane-protected amino acid coupled to the support by condensation with said reactive substituent groups is deprotected to provide a free α-amino group on said coupled amino acid, a second, similar or dissimilar N^{α}-urethane-protected amino acid in the form of its mixed anhydride is coupled to said α-amino group and the deprotection and coupling processes repeated until the desired polypeptide is obtained, the improvement wherein the mixed anhydride coupling reactions are conducted at room temperature and above.

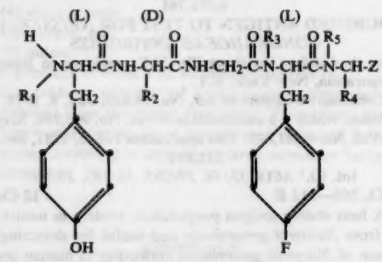
4,351,763

PHARMACOLOGICALLY ACTIVE PEPTIDES

Paul D. Gesellchen, Indianapolis, and Robert T. Shuman, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 104,348, Dec. 17, 1979. This application Apr. 24, 1981, Ser. No. 256,861
Int. Cl.³ C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 E 29 Claims

1. A compound of the formula



and pharmaceutically acceptable non-toxic acid addition salts thereof, in which

L and D define the chirality;

R_1 is hydrogen or C_1–C_3 primary alkyl;

R_2 is C_1–C_4 primary or secondary alkyl, allyl, cyclopropylmethyl, C_1–C_2 hydroxyalkyl, or $-(CH_2)_m-U-CH_3$ in which U is —S— or

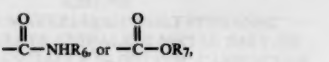
and m is 1 or 2;

R_3 is hydrogen, C_1–C_4 primary or secondary alkyl, cyclopropylmethyl, or allyl;

R_4 is phenyl, or monosubstituted phenyl in which the substituent is halo, hydroxy, C_1–C_3 alkoxy, nitro, C_1–C_3 alkyl, or trifluoromethyl;

R_5 is hydrogen; and

Z is $-CH_2OR_6$,



in which R_6 is hydrogen or C_1–C_3 alkyl and R_7 is C_1–C_3 alkyl.

4,351,764

PROCESS FOR THE SELECTIVE FORMATION OF DISULFIDE BRIDGES IN POLYPEPTIDES AND THERAPEUTIC COMPOSITIONS

Christian Birr, Leimen/St. Ilgen, Fed. Rep. of Germany, assignor to der Wissenschaften e.V. Max-Planck-Gesellschaft zur/Forderung, Gottingen, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 158,021
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923787
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.7 24 Claims

1. Process for the selective formation of at least two disulfide bridges in a polypeptide which process comprises treating a polypeptide starting material carrying at least four SH-groups to mask at least one of two of said SH-groups, intended to form a first disulfide bridge, with a p-methoxybenzyl protective group and to mask at least one SH-group of each further pair of SH-groups intended to form one or more further disulfide bridges, with an acetamido methyl protective group, then splitting off said p-methoxybenzyl protective group with pyridine-polyhydrogen fluoride in the presence of anisol to produce that first disulfide bridge, and then treating the polypeptide with iodine in an acid solution to produce said disulfide bridge-containing polypeptide by forming said one or more further disulfide bridges.

4,351,765

PROCESS FOR THE PRODUCTION OF COMPOUNDS HAVING IN THE MOLECULE AT LEAST ONE β-SULFATOETHYL-SULFONE GROUP AND AT LEAST ONE SULFONIC ACID GROUP

Taira Fujita, Nishinomiya; Hiroyuki Nakagawa, Kawanishi; Mikio Sugihara, Takatsuki; Kimiyuki Kobayashi, Minoo, and Katuhiko Okamoto, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 29, 1980, Ser. No. 116,623
Claims priority, application Japan, Feb. 13, 1979, 54/15791
Int. Cl.³ C07C *139/00, 139/100, 141/04, 141/14*
U.S. Cl. 260—163 11 Claims

1. In a process for producing a compound having in the molecule at least one sulfonic acid group and at least one β-sulfatoethylsulfone group of the formula, $-SO_2CH_2CH_2OSO_3M$, wherein M is hydrogen or an alkali metal, which comprises reacting a starting compound having in the molecule at least one sulfonic acid group and at least one β-hydroxyethylsulfone group of the formula, $-SO_2CH_2CH_2OH$, with an esterifying agent selected from the group consisting of sulfuric acid, sulfamic acid and chlorosulfonic acid, the improvement comprising

(1) conducting the reaction in the presence of a water-insoluble organic solvent and a secondary or tertiary amine represented by the formula,

wherein R_1 is a C_6–C_{24} aliphatic, aromatic or aralkyl group, and R_2 and R_3 are independently a hydrogen atom or a C_1–C_{24} hydrocarbon group, provided that R_2 and R_3 are not hydrogen atoms at the same time; the starting compound being selected from the group consisting of azo dye compounds, anthraqui-

none dye compounds, naphthalene dye compounds, pyrazolone dye compounds, and phthalocyanine dye compounds, the amount of the esterifying agent being from 1 to 10 moles per β-hydroxyethylsulfone group of the starting compound, the amount of the amine being from 1 to 10 moles per mol of the starting compound, and the reaction being carried out at a temperature of from about 40° to about 180° C.;

(2) washing the resulting reaction mixture with water or a weakly alkaline aqueous solution to remove excess of the esterifying agent; and

(3) subjecting the reaction mixture to extraction with a weakly alkaline aqueous solution, whereby an aqueous solution containing the dye is obtained.

4,351,766

PRODUCTION OF PENICILLINS

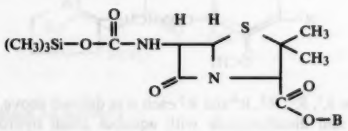
Derek Walker, Jamesville; Herbert H. Silvestri, DeWitt; Chester Sapino, East Syracuse, and David A. Johnson, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 56,976, Jul. 12, 1979, Pat. No. 4,310,458, which is a continuation-in-part of Ser. No. 21,852, Mar. 19, 1979, Pat. No. 4,240,960, which is a continuation-in-part of Ser. No. 4,780, Jan. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 970,704, Dec. 18, 1978, abandoned. This application Aug. 13, 1981, Ser. No. 292,457

Int. Cl.³ C07D *499/10*

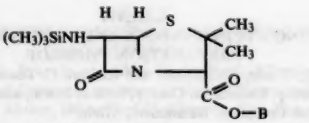
U.S. Cl. 260—239.1 **8 Claims**

1. The process for the production of a compound having the formula



wherein

B is an easily cleavable ester protecting group which comprises first forming a compound having the formula



wherein B has the same meaning as above from 6-APA and thereafter adding dry carbon dioxide to a solution thereof in an anhydrous inert organic solvent at a temperature in the range of 0° C. to 100° C. until completion of the reaction.

4,351,767

SYNTHESIS OF 24,25-DIHYDROXYCHOLESTEROL

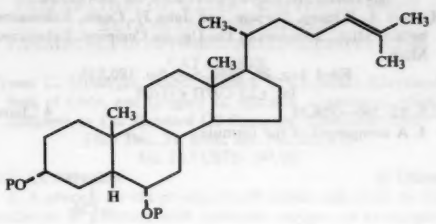
Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

Filed Jun. 29, 1981, Ser. No. 278,838

Int. Cl.³ C07J *71/00*

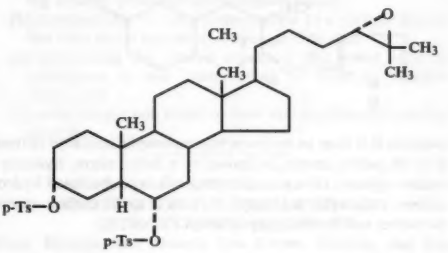
U.S. Cl. 260—239.55 R **12 Claims**

1. A compound having the structure:



where P is 2-tetrahydropyranyl, β-methoxyethoxymethyl, tertiary-butyl, trimethylsilyl or tertiary-butyldimethylsilyl.

6. A compound having the structure:



where ρ-Ts=ρ-toluenesulfonyl.

4,351,768

2-[(3-INDOLYL)CARBONYL]-4/5-CARBOXYBENZOIC ACIDS

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

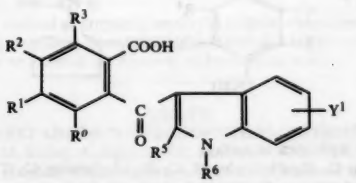
Division of Ser. No. 27,031, Apr. 4, 1979, Pat. No. 4,251,446, which is a continuation-in-part of Ser. No. 868,583, Jan. 11, 1978, Pat. No. 4,189,171, which is a continuation-in-part of Ser. No. 773,180, Mar. 1, 1977, abandoned. This application Mar. 14, 1980, Ser. No. 130,353

Claims priority, application Canada, Feb. 16, 1978, 296986; United Kingdom, Feb. 16, 1978, 6228/78

Int. Cl.³ C07D *209/24*

U.S. Cl. 260—326.13 R **2 Claims**

1. A 2-{[(1-R^6-2-R^5-5/6-Y^1)-3-indolyl]carbonyl}-3-R^0-4-R^1-5-R^2-6-R^3-benzoic acid of the formula



wherein

R^0, R^3 and one of R^1 and R^2 are each hydrogen, and the other of R^1 and R^2 represents carboxy;

R^5 represents hydrogen, C_1 to C_3 alkyl or phenyl,

R^6 represents hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl; and

Y^1 represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro.

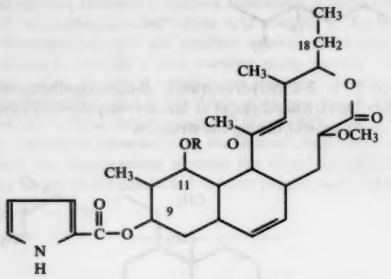
4,351,769

ANTIBIOTIC COMPOSITION OF MATTER

Howard A. Whaley, Portage, and John H. Coats, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 25, 1980, Ser. No. 180,529
Int. Cl.³ C07D *493/08*
U.S. Cl. 260—326.34 **4 Claims**

1. A compound of the formula



wherein R is H or an hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, or loweralkoxy-substituted hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; and loweralkoxycarbonyl.

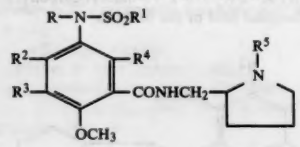
4,351,770

PREPARATION OF N(2-PYRROLIDINYLMETHYL)2-METHOXY-5-BENZENESULFONAMIDOBENZAMIDES

Masaru Ogata, Kobe, and Hiroshi Matsumoto, Takatsuki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 872,584, Jan. 26, 1978, abandoned. This application Dec. 6, 1978, Ser. No. 967,011
Claims priority, application Japan, Jan. 27, 1977, 52/8443; Aug. 8, 1977, 52/94884
Int. Cl.³ C07D *208/09*; A61K *31/40*
U.S. Cl. 548—567 **1 Claim**

1. A process for preparing a meta-sulfonamidobenzamide compound of the formula:



wherein

R is hydrogen or methyl,

R^1 is C_1–C_6 alkyl, phenyl, C_1–C_6 alkylamino, C_2–C_{12} dialkylamino or C_4–C_5 alkyleneamino,

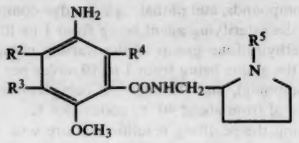
R^2 is hydrogen, halogen, C_1–C_6 alkyl, C_2–C_{12} dialkylamino or C_1–C_6 alkoxy,

R^3 is hydrogen, methyl or methoxy,

R^4 is hydrogen or halogen, and

R^5 is C_1–C_6 alkyl, C_2–C_6 alkenyl, C_3–C_6 cycloalkyl, benzyl or halobenzyl,

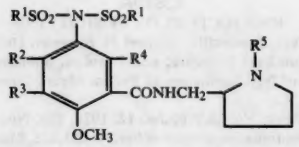
or a pharmaceutically acceptable acid addition salt of said compound, which comprises the step of reacting an anilino compound of the formula:



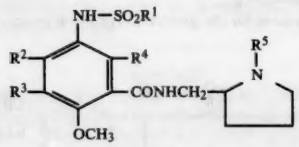
wherein R^2, R^3, R^4 and R^5 each is as defined above, with a sulfonating agent of the formula:

$$A\text{-}SO_2R^1$$

wherein A is chlorine or bromine, and R^1 is as defined above, in an inert solvent in the presence of 2.0 or more mol equivalents of triethylamine at a temperature of 0°–100° C. to yield a disulfonamide of the formula:



wherein R^1, R^2, R^3, R^4 and R^5 each is as defined above, or a mixture of said disulfonamide and a monosulfonamide of the formula:



wherein R^1, R^2, R^3, R^4 and R^5 each is as defined above, hydrolyzing said disulfonamide with aqueous alkali hydroxide in methanol with heating on a water bath to yield said monosulfonamide, and, if said meta-sulfonamidobenzamide compound wherein R is methyl is desired, subjecting said monosulfonamide to methylation.

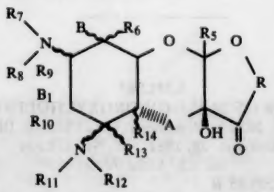
4,351,771

SPECTINOMYCIN ANALOGS AND METHODS FOR THE PREPARATION THEREOF

David R. White, Kalamazoo, and Richard C. Thomas, Oshtemo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

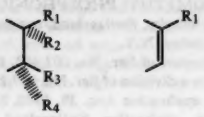
Continuation-in-part of Ser. No. 20,172, Mar. 13, 1979, abandoned. This application May 16, 1980, Ser. No. 150,530
Int. Cl.³ C07H *17/04, 17/00*; C07D *319/24*
U.S. Cl. 549—361 **52 Claims**

1. Anomers and asteric mixtures of a compound having the formula



1

wherein R is selected from the group consisting of



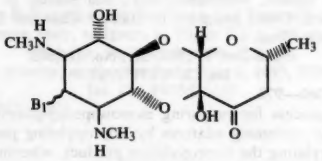
wherein R_1 through R_4 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower haloalkyl, lower aminoalkyl, lower alkynyl, —OX and $—(CH_2)_n—OX$ and isomers thereof with the proviso that R_1 and R_2 are not hydroxy and one of R_3 and R_4 must be hydrogen,

wherein X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, benzyl and acyl;

n is an integer of from one to four,

R_5 is hydrogen or lower alkyl;

R_6 through R_{14} are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl with the proviso that one of R_7 and R_8 is always hydrogen and one of R_{11} and R_{12} is always hydrogen, and B and B_1 are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio-lower alkyl and thio-lower alkenyl, and A is selected from the group consisting of oxygen and sulfur, hydrated forms thereof, and pharmaceutically acceptable salts of the compound of formula I and hydrated forms thereof; with the proviso that when the compound has the formula



B_1 cannot be hydroxy.

4,351,772

6(9)-ISOPROPYL-9(6)-METHYL-6,9-ETHANO-2-OXASPIRO[4,5]DEC-7-ENES

Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

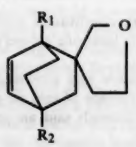
Filed Nov. 20, 1981, Ser. No. 323,430

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046068

Int. Cl.³ C07D *307/94*

U.S. Cl. 549—331 **1 Claim**

1. A mixture of isomers of the formula



wherein R_1 and R_2, which are different from each other, are each methyl or isopropyl.

4,351,773

PREPARATION OF MALEIC ANHYDRIDE FROM BUTANE USING FLUIDIZED VANADIUM-PHOSPHOROUS-OXIDE CONTAINING CATALYSTS

Ernest C. Milberger, Solon; Michael F. Lemanski, Cleveland, both of Ohio, and Gregory G. Spitnale, Kalamazoo, Mich., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 31, 1980, Ser. No. 221,670

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—259 **12 Claims**

1. A process for the production of maleic anhydride by the oxidation of n-butane with molecular oxygen or an oxygen-containing gas in a fluid bed reactor at a reaction temperature of about 250° C. to 600° C. in the presence of a microspheroidal, fluidizable catalyst containing the mixed oxides of vanadium and phosphorus, wherein said catalysts is prepared by:

(a) preparing a vanadium phosphorus mixed oxide containing catalyst precursor in an organic liquid;

(b) comminuting the catalyst precursor to a particle size of less than about one micron average diameter;

(c) introducing the catalyst precursor into water prior or subsequent to said comminuting to form an aqueous slurry; and

(d) spray drying said slurry to form microspheroidal catalyst particles.

4,351,774

PROCESS FOR THE PRODUCTION OF METHOXYANTHRAQUINONES

Peter Baumgartner, Sissach; Urs Karlen, Magden, and Urs Keller, Muttenz, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 20, 1980, Ser. No. 132,054

Claims priority, application Switzerland, Mar. 29, 1979, 2920/79

Int. Cl.³ C07C *49/74*

U.S. Cl. 260—383 **7 Claims**

1. A process for the production of methoxyanthraquinones of high purity by reaction of nitroanthraquinones with methanol and alkali, which process comprises carrying out the reaction in the presence of an alkali-resistant nitrous acid inhibitor selected from a group consisting of primary and secondary amines, and sulfamic acid to inhibit secondary reactions which are catalyzed by nitrous acid.

4,351,775

METHOD FOR PREPARATION OF ALKYL VANADATES

Walter L. Magee, Jr., Danbury, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 20, 1981, Ser. No. 245,868

Int. Cl.³ C07F *9/00*

U.S. Cl. 260—429 R **7 Claims**

1. A method of preparing an alkyl vanadate which comprises heating vanadium pentoxide and an alkyl alcohol in an alkane solvent to assist in the removal of by-product water.

4,351,776

PREPARATION OF IODOPHTHALONITRILE

Teddy M. Keller, Alexandria, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 78,402, Sep. 24, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,999

Int. Cl.³ C07C *121/56*

U.S. Cl. 260—465 G **4 Claims**

1. A process of making iodophthalonitrile comprising:

mixing an aminophthalonitrile with an excess of H_2SO_4 at a temperature of about 0° C. to 25° C. until the resultant reaction is substantially complete;

cooling the solution to below about 15° C.;

adding cold water to said solution at a solution temperature below 25° C. to produce amine bisulfate;

adding aqueous $NaNO_2$ to said solution at a solution temperature of about 0° C. to 20° C. to produce a diazonium salt solution;

mixing said diazonium salt solution with an excess of KI until the resulting reaction is substantially complete;

separating and purifying the resultant reaction product, iodophthalonitrile, from said solution.

4,351,777

PREPARATION OF FLUOROBENZONITRILES

R. Ramanadin; Alain Roustan, both of Ales, and Gerard Soula, Meyzieu, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 22, 1981, Ser. No. 304,627

Claims priority, application France, Sep. 25, 1980, 80 20573

Int. Cl.³ C07C *121/52*

U.S. Cl. 260—465 G **13 Claims**

1. A process for the preparation of a fluorobenzonitrile, comprising reacting the chlorobenzonitrile corresponding thereto with at least one alkali metal fluoride, in an aprotic solvent reaction medium, in the presence of an effective amount of at least one tertiary amine sequestering agent having the structural formula:

$$N—CHR_1—CHR_2—O—(CHR_2—O)_nR_5]_3 \quad (I)$$

wherein n is a number greater than or equal to 0 and less than or equal to about 10, R_1, R_2, R_3, R_4, which may be identical or different, each represents a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms and R_5 represents an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical of the formula $—C_mH_{2m}—\phi$, or $C_mH_{2m+1}—\phi—$, with m ranging from 1 to about 12 and ϕ being phenyl.

4,351,778

PROCESS FOR THE RECOVERY OF MALONODINITRILE

Axel Kleemann, Hanau, and Peter M. Schalke, Seligenstadt, both of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,857

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006492

Int. Cl.³ C07C *120/00, 121/22*

U.S. Cl. 260—465.8 R **11 Claims**

1. In a process for the recovery of malononitrile prepared by reacting cyanogen chloride with acetonitrile at 500°–1200° C. and working up the reaction gas mixture, the improvement comprising fractionally condensing the reaction gas mixture alone or together with an inert gas in several successive temperature steps in which the first temperature step has the highest temperature and the last temperature step has the lowest temperature, the temperature drop in the first condensation step is to a temperature not below 80° C. and not above 170° C. thereby condensing the malonodinitrile as a first condensate, drawing off the condensed crude malonodinitrile as sump product, supplying the non-condensed portion which consists chiefly of unreacted acetonitrile and cyanogen chloride as well as hydrogen chloride and low boiling byproducts to a second temperature step between 20° C. and 82° C., thereby condensing the residual acetonitrile and cyanogen chloride as a second condensate and drawing off the second condensate and separately working up the condensate obtained in each step.

4,351,779

PROCESS FOR THE PRODUCTION OF METHYLAMINOMETHYLPHOSPHONIC ACID ESTERS

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

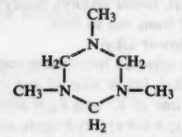
Continuation-in-part of Ser. No. 102,463, Dec. 10, 1979, abandoned, which is a division of Ser. No. 947,271, Sep. 29, 1978, abandoned. This application Aug. 28, 1980, Ser. No. 182,170

Claims priority, application Switzerland, Oct. 4, 1977, 12100/77; United Kingdom, Oct. 3, 1978, 39087/78

Int. Cl.³ C07F *9/40*

U.S. Cl. 260—970 **5 Claims**

1. A process for the production of methylaminomethylphosphonic acid esters and of the corresponding free acid, which comprises heating at a temperature of from about 20° to about 150° C., trimethylhexahydro-s-triazine of the formula



with at least 3 moles of a secondary dialkyl phosphite having branched alkyl radicals to obtain a diester.

4,351,780

PROCESS FOR PREPARING ISOPROPYLPHENYL/PHENYL PHOSPHATE

Silvio L. Giolito, Whitestone, N.Y., and Stanley B. Mirviss, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 9, 1980, Ser. No. 214,553

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—974 **5 Claims**

1. A process for preparing monoisopropylphenyl/phenyl phosphate containing mixtures by isopropylating phenol and phosphorylating the isopropylation product; wherein the improvement comprises the sequential steps of:

(A) alkylating phenol with propylene using a p-toluene sulfonic acid catalyst under conditions effective to yield an isopropylated product having a C_3/ϕ ratio of less than 0.25;

(B) distilling the isopropylated product of step (A) to remove unreacted phenol to yield a fractionated product having a C_3/ϕ ratio of at least 0.30;

(C) phosphorylating the distilled product of step (B) to yield a monoisopropylphenyl/diphenyl phosphate containing mixture having a reduced 2,6-diisopropylphenyl/phenyl phosphate content.

4,351,781

TERRACED WATER DISTRIBUTOR FOR EVAPORATIVE AIR CONDITIONER

Kenneth F. Blatter, Phoenix, Ariz., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 140,039, Apr. 14, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,601

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—29 **1 Claim**

1. An evaporative air conditioner comprising:

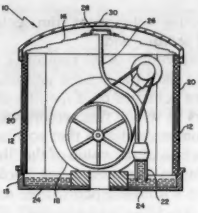
a. a housing having at least one air-pervious portion about its periphery;

b. at least one wettable pad mounted within said housing against the inner surface of said air-pervious portion such that air flowing through said air-pervious portion flows through said pad;

c. air suction means mounted within said housing for drawing air through said air-pervious portion and pad;

d. a unitary imperforate liquid distributor mounted above

said pad having a downwardly sloping distributor surface extending from an upper portion generally central of said housing to a lower edge that is contiguously above the upper edge of the wettable pad, said distributor including a plurality of terraced steps in said distributor surface spaced apart in said sloping direction and extending about the distributor surface in generally parallel relation to the



periphery of said housing for affording a cascade flow of liquid from said upper portion to said lower edge; and

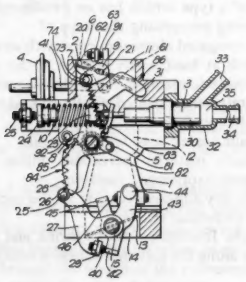
e. liquid supply means for supplying liquid to the center of said distributor such that said liquid flows downwardly by gravity in a cascading flow over said distributor surface portion and directly onto the entirety of the upper edge of said wettable pad.

4,351,782

COLD-ENGINE STARTING AND OPERATING DEVICES FOR CARBURETORS

Francesco Bellicardi; Carlo Dall'Osso, and Bruno Cavallari, all of Bologna, Italy, assignors to Weber S.p.A, Bologna, Italy

Filed Jan. 16, 1981, Ser. No. 225,694
Claims priority, application Italy, Feb. 6, 1980, 3329 A/80
Int. Cl.³ F02M *1/10*
U.S. Cl. 261—39 A **5 Claims**



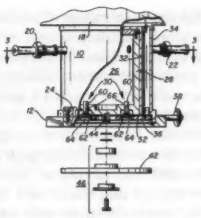
1. Improvements in cold-engine starting and operating devices for carburetors, consisting in an arrangement comprising a cam lever pivotally mounted on the central portion of the carburetor body between a main throttle valve of said carburetor and a choke valve mounted eccentrically in the carburetor body tube upstream of the choke portion and pneumatically operated by a pull-rod connected with a member sensitive to the vacuum in the intake manifold downstream from the throttle valve, a mobile element of a temperature-sensitive member which heats up as the engine temperature increases, which mobile element is movable against first elastic means which are adapted to act upon said cam lever, a choke lever fixed on a spindle of said choke valve and a first lever pivotally mounted on a spindle of said throttle valve, said cam lever being pivoted in its medial extent to the carburetor body and biased to rotate by second elastic means as far as a limit defined by said mobile element, respective opposite ends of said cam lever having cam contours acting separately against said choke and first lever respectively to compel them to rotate against the action of third and fourth respective elastic means in order to open said choke valve and to reduce the small opening of said throttle valve, said third elastic means being connected at one end to said choke lever and at the other end on an appendix outstanding from said cam lever.

4,351,783

COMBUSTION FUEL AND AIR FLOW CONTROL AND MIXER APPARATUS

Donald G. Bennett, 1240 N. Kelly Ave., Odessa, Tex. 79760

Filed May 26, 1981, Ser. No. 266,709
Int. Cl.³ F02M *17/16*
U.S. Cl. 261—44 E **9 Claims**



1. Flow control apparatus for simultaneously controlling the rate of flow of a stream of fuel and a stream of air, and for mixing the streams of fuel and air together to form a combustible mixture, comprising:

a housing having an air inlet end and an air outlet end; a fuel inlet by which a supply of fuel can be connected to the flow control apparatus; a fuel chamber formed within said housing, said fuel chamber is connected to receive a flow of fuel from said fuel inlet, a valve means for controlling fuel flow from said chamber;

a plurality of individual air flow passageways radially spaced respective to one another and having opposed ends, with one end arranged to commence at said air inlet end and the other end arranged to terminate adjacent said air outlet end;

an apertured movable plate member mounted to move about the axial centerline thereof and respective to said housing, said plate member being operatively connected to engine accelerator linkage and movable from one to an alternate position, there being an aperture in said plate which is aligned with a flow passageway when the plate member is moved to said one position, the apertures of said plate being misaligned with said flow passageways when the plate member is moved to the alternant position to thereby reduce air flow through the passageways to a minimum;

said other end of said air passageways forms an outlet end which terminates in a common plane;

said plate member has a face thereof which lies parallel to the plane formed by the outlet ends of the air passageways and abuttingly engages the ends of the passageways to thereby control the flow of air therethrough as the apertures are moved into and out of alignment with the passageways;

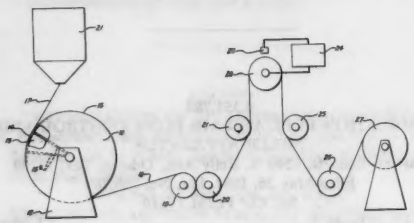
a cam means formed on said plate for actuating said valve means, said valve means being actuated toward the open position proportional to the opening formed between the plate apertures and the air passageways so that the air/fuel ratio is maintained substantially constant.

4,351,784

CORONA TREATMENT OF PERFORATED FILM

Paul E. Thomas, and Garland E. Raley, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 15, 1980, Ser. No. 216,269
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—22 **10 Claims**



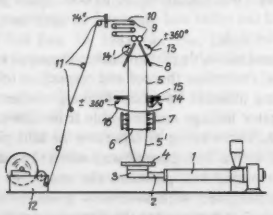
6. In a process for the preparation of perforated thermoplastic film having tapered capillaries, said process comprising forming a hot film of thermoplastic material, applying the hot film to a moving perforated screen, and applying an air pressure differential across the film toward a portion of the screen sufficient to distort the film into the perforations and cause rupture of the film, the improvement comprising subjecting said perforated film to a corona discharge treatment sufficient to provide a perforated film having an increased liquid flow through rate over that of said perforated thermoplastic film prior to the corona discharge treatment and said film has a percent run off of from 5 percent to 20 percent.

4,351,785

METHOD OF CONTROLLING THE FILM THICKNESS AT A BLOWN FILM EXTRUDER INSTALLATION

Hartmut Upmeier; Gerd Klinge, and Gerhard Winkler, all of Lengerich, Fed. Rep. of Germany, assignors to Windmöller & Höischer, Lengerich, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,732
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2950003
Int. Cl.³ B29F *3/08*; G05D *5/02*
U.S. Cl. 264—40.1 **6 Claims**



1. A method of controlling the film thickness at a blown film extruder installation, the installation comprising a nozzle ring for extruding tubular film divided into control sectors provided with setting elements, a film calibrating device, and a take-off and coiling apparatus for the film, said method comprising:

forming film sectors (x_F) corresponding to the number of control sectors, the film sectors having equal circumferential lengths;

measuring thicknesses over the circumference of the extruded film;

assigning the measured film thicknesses to the film sectors (x_F);

determining mean thickness distributions ($\bar{s}''_x$) for the individual film sectors;

determining a first film sector having maximum or minimum thickness;

assigning such first film sector to an associated control sector at the nozzle ring based on a predetermined correct relationship between such film sector and the nozzle ring not influenced by variations in thicknesses of other film sectors;

successively alloting subsequent film sectors to the subsequent control sectors; and

adjusting the temperature of the respective control sectors at the nozzle ring until the desired uniform thickness distribution has been achieved over the film circumference, the control sectors to which film sectors were allocated having thin portions exceeding a thin portion threshold value which is a fraction of the value of the film sector with the absolute minimum thickness being cooled until the film thicknesses are within the permissible tolerance range.

4,351,786

METHOD FOR MAKING A STRESS-RELIEVED COMPOSITE FOAMED RESIN BASEBALL BAT OR BOWLING PIN

Alvin W. Mueller, Ferguson, Mo., assignor to Mueller-Perry Co., Inc., St. Louis, Mo.

Filed Aug. 25, 1980, Ser. No. 181,175
Int. Cl.³ B29D *27/04*; A63B *59/06*; A63D *9/00*
U.S. Cl. 264—46.7 **4 Claims**

1. The method of making a molded composite baseball bat, bowling pin or like article having a body of cured-in-place foam plastic of a type which has an exothermic reaction and shrinks on curing comprising the steps of

coating an elongated aluminum core with an adhesive of the type which at least partly softens at the temperature of such exothermic reaction and which at room temperature will securely bond foamed plastic to said core

causing said coating to dry,

mounting said coated core within a mold,

foaming plastic material thereabout within the mold and causing such exothermic reaction,

softening the dry adhesive coating on the core with the heat of such exothermic reaction,

permitting the foamed plastic to shrink and draw together slippingly along the softened adhesive coating on the core, and

thereafter permitting the adhesive coating to harden during cooling of said foamed plastic,

whereby to minimize stresses which would otherwise accompany resistance of the core to the shrinking of the plastic.

4,351,787

PROCESS FOR SINTERING REACTION BONDED SILICON NITRIDE

PierCarlo Martinengo; Angelo Giachello; Giuseppe Tommasini, all of Turin, Italy, and Paul Popper, Newcastle, England, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Dec. 18, 1978, Ser. No. 970,594
Claims priority, application Italy, Dec. 23, 1977, 69900 A/77
Int. Cl.³ C04B *35/58*
U.S. Cl. 264—65 **13 Claims**

1. A process for increasing the density of a reaction bonded silicon nitride article, which comprises the steps of:

forming a silicon powder compact consisting essentially of

silicon powder and one or more sintering additives for silicon nitride, the compact having a density of at least 1.3 g/cm^3, said additives being present in the silicon powder in an amount such as to ensure an additive content of from 0.5 to 20 wt.% in the silicon nitride compact wherein the sintering additives are selected from the group consisting of MgO, Y_2O_3, CeO_2 and mixtures thereof with Fe;

nitriding the silicon compact by heating under nitrogen gas blanket at a temperature not exceeding 1500° C., to convert said silicon into reaction bonded silicon nitride, and

sintering the reaction bonded silicon nitride compact by heating in a nitrogen gas atmosphere at a temperature of at least 1500° C., said sintering being in the substantial absence of mechanical pressure, whereby said density is increased.

4,351,788
METHOD FOR THE MANUFACTURE OF CLEAVING TILES

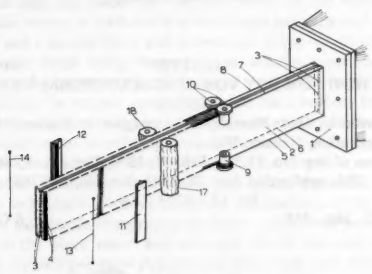
Gustaaf J. Schreurs, Tegelen, Netherlands, assignor to Mosa, B.V., Maastricht, Netherlands

Filed Feb. 26, 1980, Ser. No. 124,902

Claims priority, application Netherlands, Mar. 1, 1979, 7901625

Int. Cl.³ B28B *11/00*

U.S. Cl. 264—67 **8 Claims**



1. A method for manufacturing cleaving tiles from a continuously extruded column of a ceramic material having exterior top, bottom and opposing pair of side walls comprising the steps of:

(a) extruding a column of a ceramic material while simultaneously forming a plurality of internal channels, through which air has constant access, each having an elongated axis extending parallel to the direction of movement of the extrusion through the length of the extrusion substantially half way between the pair of side walls;

(b) passing the extrusion through a first shaping station to shape the exterior edges defined by the top, bottom and opposing exterior side walls so that the exterior edges have a rounded, undulating surface;

(c) passing the extrusion through a second shaping station to form a compressed indentation on each side of the extrusion without compressing the plurality of internal channels thereby maintaining air therein, the indentation having parallel opposing rounded and undulating side edge portions terminating along a line substantially perpendicular to the direction of movement of the extrusion;

(d) severing the extrusion into individual segments along the line between the side edge portions formed according to step (c);

(e) firing the individual segments; and

(f) cleaving the individual segments fired according to step (e) to form two separate tiles from each individual segment.

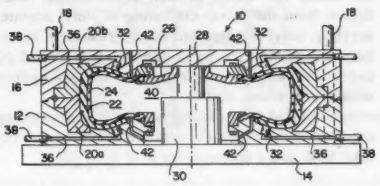
4,351,789
MOLD AND PROCESS FOR MOLDING

James Sidles, Richfield, and Jerome J. Blayne, Brecksville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 27, 1981, Ser. No. 286,782

Int. Cl.³ B29H *5/02*

U.S. Cl. 264—130 **9 Claims**



1. A process for molding a rubber or plastic article from a blank within a mold cavity of a mold formed by a plurality of mating mold segments, said process comprising:

(a) forming a liquid film of a coating material on the surface of said mold cavity or on the surface of the blank from which the article is to be molded or on both the surface of said mold cavity and the surface of said blank immediately prior to closing said mold, said coating material having a boiling point above the ambient temperature of the work area in which the molding is performed and below the molding temperature at which the article will be molded;

(b) moving said mold with said blank loaded therein to the closed position and exerting externally-applied pressure to maintain said mold cavity in said closed position;

(c) raising the temperature within said mold cavity to a temperature above the boiling point of said coating material;

(d) reducing said externally-applied pressure maintaining said mold cavity in a closed position to expose vapor release passages existing between mating surfaces of said mold segments of said mold through which said coating material in vapor form can exhaust carrying with it air entrapped within said mold cavity as the mold is closed;

(e) re-exerting externally-applied pressure to return said mold cavity to the closed position;

(f) raising the temperature within said mold cavity to a molding temperature at which molding of the article will occur and maintaining said molding temperature for the required molding time period; and

(g) opening said mold and removing the molded article therefrom.

4,351,790
MANUFACTURE OF INSULATED ELECTRIC CONDUCTORS

Ulrich Hochstrasser, Ecublens, and Eberhard Kertscher, Romanel-sur-Lausanne, both of Switzerland, assignors to Maillefer S.A., Switzerland

Filed Mar. 27, 1980, Ser. No. 134,634

Claims priority, application Switzerland, Apr. 3, 1979, 3101/79

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—174 **6 Claims**

1. A method of producing a tubular element of cross-linked plastic material, particularly an insulating covering for an electric conductor, of the type wherein a polymer capable of being cross-linked by the use of a hydrolyzable unsaturated silane is fed, together with metered quantities of additives including a free-radical generator and a silanol condensation catalyst, to a screw-type extruder divided into a heating zone, a plasticizing zone, and a homogenizing zone; a metered quantity of a hydrolyzable unsaturated silane is added separately to

the extruder; the foregoing substances are actively stirred in the extruder until a homogeneous mass is obtained; the homogenized mass is extruded; and cross-linking of the product is carried out in the presence of moisture, wherein the improvement comprises the steps of

including among said additives an agent capable of reducing the rate of crystallization of said polymer to enhance penetration of said moisture into said extruded mass, thus increasing the speed of said cross-linking, said agent drawn from the group consisting of vinyl acetate, vinyl acrylate, butyl acrylate and polymers thereof in a proportion of 0.5% to 15% by weight relative to said polymer capable of being cross-linked by the use of a hydrolyzable unsaturated silane, and

carrying out said cross-linking in a moist air atmosphere, said moist air atmosphere exhibiting a relative humidity of at least 60% and a temperature of at least 20° C.

4,351,791

METHOD FOR INSTALLING A SEALING BODY IN A GROOVE OF A SOCKET AND PIPE PART OF PLASTIC MATERIAL

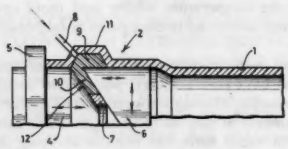
Warner J. de Putter, an Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Dec. 16, 1980, Ser. No. 216,965

Claims priority, application Netherlands, Dec. 21, 1979, 7909293

Int. Cl.³ B29C *27/16, 7/00*

U.S. Cl. 264—267 **2 Claims**



1. In a method for installing a sealing body having a lip shaped part **10** of resilient material in a groove **3** of a socket **2** of plastic material the steps comprising forming a closed space **12** inside said socket **2** which space embraces the walls of an axially movable inner core part **4** and a radially retractable core part **6**, filling said groove **3** and space **12** with a flowable elastomeric composition confined by the walls of interconnected core parts **4** and **6**, and axially removing inner core part **4** and inner core part **6** after radially retracting core part **6**, whereby the lip shaped part **10** of the sealing body is undeformed by removing the core parts.

4,351,792

APPARATUS FOR MAKING GROOVES IN TOBACCO SMOKE FILTERS

John H. Sexstone, Anchorage; Tom Lewis, and Ken Milliner, both of Louisville, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

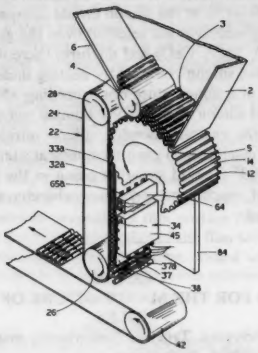
Division of Ser. No. 167,554, Jul. 11, 1980, Pat. No. 4,324,540. This application Mar. 23, 1981, Ser. No. 245,872

Int. Cl.³ B29D *31/00*

U.S. Cl. 264—293 **5 Claims**

1. A method of making substantially longitudinal grooves in cigarette filter rods comprising the steps of:

(a) feeding filter rods linearly and substantially parallel to a stationarily mounted heated groove-forming device; and,



(b) rolling said filter rods in contacting relation with said heated groove-forming device to form grooves in said rods.

4,351,793

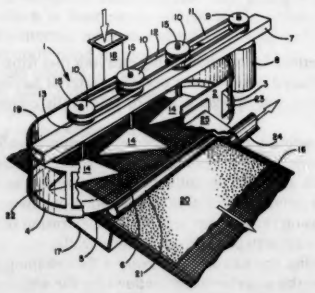
METHOD FOR DRY FORMING A UNIFORM WEB OF FIBERS

Winterton U. Day, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 13,362, Feb. 21, 1979, Pat. No. 4,264,289. This application Apr. 28, 1981, Ser. No. 258,266

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—518 **6 Claims**

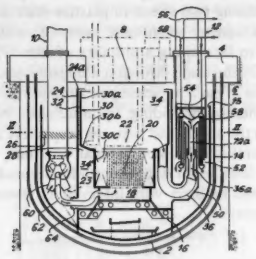


1. A method of reducing variations in the basis weight of a layer of fibers produced on a foraminous surface of a traveling screen in a dry forming process by the deposition of fibers from an air-fiber mixture directed to the foraminous surface through a perforated bottom wall of a housing under the influence of impeller means mounted in the housing closely above and spaced from the upper surface of the perforated wall comprising the steps of obtaining a basis weight profile of a transverse section of a layer of the fibers to determine the variation in fiber density across the layer, and providing in the perforated bottom wall zones of differing aperture sizes which extend longitudinally with the foraminous surface of the traveling screen to minimize differences in the basis weight profile of the layer produced.

4,351,794
FAST NEUTRON REACTOR

Robert Artaud, Aix en Provence; Michel Aubert, Manosque, and Charley Renaux, Jouques, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 28, 1980, Ser. No. 134,898
Claims priority, application France, Apr. 6, 1979, 79 08793
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—404 8 Claims



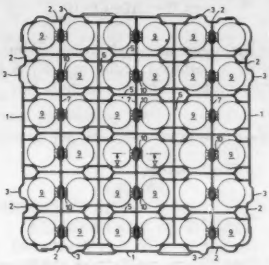
1. A fast neutron reactor cooled by a liquid metal, comprising: a main vessel sealed by an upper slab and having a bottom, and within said main vessel, a cylindrical inner vessel with a vertical axis and placed on flooring resting on the bottom of the main vessel, at least one heat exchanger between said liquid metal and a second fluid, and at least one pump for circulating the liquid metal being located in an annular space defined between the main vessel and the inner vessel, the inner vessel containing the reactor core which rests on a support bearing against the bottom of the main vessel by means of said flooring, the liquid metal circulating from bottom to top through the reactor core, wherein said reactor further comprises an internal baffle which is located within and spaced from said inner vessel and which revolves about the vertical axis of the inner vessel, said baffle comprising an upper cylindrical part adjacent to the inner vessel and arranged above the core, and a lower cylindrical part surrounding the core and having a smaller diameter than the upper part, said lower part being connected to the upper part by a frustum-shaped part, whereby the baffle confines the "hot" liquid metal leaving the core entirely above the latter and at least one pipe being arranged between the frustum-shaped part of the baffle and at least one heat exchanger for connecting the intake of the latter to the inner volume defined by the baffle.

4,351,795
GRIDS FOR NUCLEAR FUEL ASSEMBLIES

Graham Nicholson, Kirkham, England, assignor to British Nuclear Fuels Limited, Warrington, England

Filed Sep. 30, 1980, Ser. No. 192,614
Claims priority, application United Kingdom, Oct. 17, 1979, 7936031
Int. Cl.³ G21C *3/34*
U.S. Cl. 376—442 15 Claims

1. A grid for a nuclear fuel assembly comprising sets of generally parallel strips arranged to intersect to define a structure of cellular form, at least some of the intersections including a strip which is secured to one other strip at more than one point at one intersection, the plural securement points of the

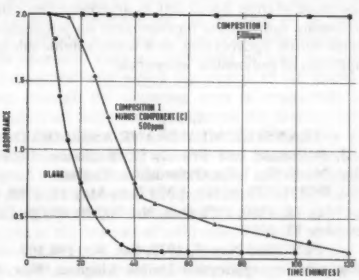


intersection being spaced from each other along the length of one of the two strips.

4,351,796
METHOD FOR SCALE CONTROL

Alan Marshall, Macclesfield, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

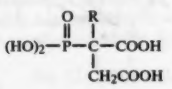
Continuation-in-part of Ser. No. 124,058, Feb. 25, 1980, abandoned, which is a continuation of Ser. No. 21,650, Mar. 19, 1979, abandoned, which is a continuation of Ser. No. 849,743, Nov. 9, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 213,144
Int. Cl.³ C23F *11/16, 11/18*
U.S. Cl. 422—15 4 Claims



1. A method of inhibiting the deposition of calcium phosphate scale or sludge from an aqueous system, treated with a corrosion inhibitor formulation, which method comprises

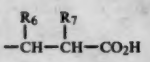
treating the aqueous system with 1 to 100 ppm, based on the aqueous system, of a formulation which consists essentially of

(a) 40 to 69.5% by weight of the total formulation of a phosphono-carboxylic acid selected from the group consisting of a compound of formula II

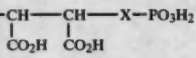


(II)

wherein R is hydrogen, an alkyl, an alkenyl or alkynyl group, each having up to 4 carbon atoms, a phenyl group, cycloalkyl group having from 3 to 6 carbon atoms, a benzyl group, a phenethyl group or a residue having the formula:

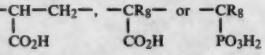


wherein R_6 is hydrogen, an alkyl group having from 1 to 4 carbon atoms or a carboxyl group and R_7 is hydrogen or methyl group; a compound having formula III



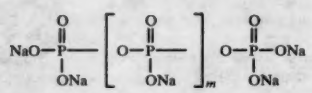
(III)

wherein X is



wherein R_8 is hydrogen or methyl; and a mixture of compounds selected from the group consisting of those of formula II and formula III;

(b) 30 to 50% by weight of the total formulation of a polyphosphate selected from the group consisting of tetrasodium pyrophosphate, sodium tripolyphosphate or a polymeric sodium metaphosphate of formula:



(IV)

wherein m is an integer from 4 to 20; and

(c) 0.5 to 10% by weight of the total formulation of hydrolyzed polymaleic anhydride having a molecular weight in the range of from 300 to 500, as determined by calculation following osmometric measurement on polymaleic anhydride before hydrolyzing, or a water soluble salt of such a hydrolyzed polymaleic anhydride.

4,351,797

TRANSFER MEMBRANE ASSEMBLY

Brian J. Bellhouse, and Francis H. Bellhouse, both of The Lodge, North St., Islip, Oxfordshire, England

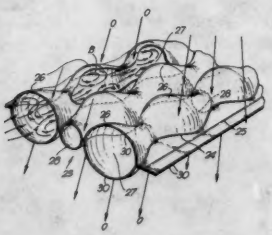
PCT No. PCT/GB79/00181, § 371 Date May 15, 1980, § 102(e) Date May 15, 1980, PCT Pub. No. WO80/00920, PCT Pub. Date May 15, 1980

PCT Filed Nov. 7, 1979, Ser. No. 198,107

Claims priority, application United Kingdom, Nov. 8, 1978, 43618/78

Int. Cl.³ A61M *1/03;* B01D *31/00*

U.S. Cl. 422—48 **14 Claims**



1. In an apparatus for transferring heat or mass between two fluids, said apparatus comprising at least one first conduit having a feed end and a discharge end and defined at least in part by a transfer membrane, first feed means for feeding a first fluid to said first conduit feed end, first discharge means for discharging the first fluid from the said first conduit discharge end, housing means at least in part surrounding said first conduit and defining a second conduit, having a feed end and a discharge end, for a second fluid flowing in contact with said transfer membrane, second feed means for feeding the second fluid to the second conduit feed end, and second discharge means for discharging the second fluid from the second conduit discharge end, the improvement comprising said first conduit comprising two sheets of plastics material, at least one of which is a transfer membrane material, which are sealed together face to face along a plurality of sinuous lines extending generally in the same direction alongside one another with the undulations of each adjacent pair of lines out of phase with one another thereby providing, upon inflation of the passageways between the sheets and between respective adjacent pairs of lines, a plurality of nested tubular conduits, separated by common seal lines, each with longitudinally and substantially regularly spaced hollows with intervening constrictions, in a side-by-side array.

4,351,798

ANALYZING APPARATUS FOR LIQUID SAMPLES

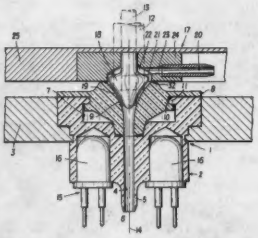
Hermann Marsoner; Helmut List, both of Graz, and Erich Kleinhappl, Kumberg, all of Austria, assignors to Hans List, Graz, Austria

Filed Feb. 11, 1981, Ser. No. 233,574

Claims priority, application Austria, Feb. 12, 1980, 748/80; Aug. 14, 1980, 4196/80

Int. Cl.³ G01N *1/14, 35/06*

U.S. Cl. 422—63 **9 Claims**



1. Feeding means for the feeding of liquid samples from sample containers into an analyzing apparatus for measuring the samples, the feeding means comprising a support having a sample conduit and an upwardly open substantially funnel-shaped filling mouth to accommodate use of the sample containers having various matching-part outlet diameters, said filling mouth being of resilient material and being aligned with said sample conduit through which the liquid samples are fed.

4,351,799

MICROMETERING LIQUID SAMPLE DISPENSER

Valery N. Gross, ulitsa Luganskogo, 73; Evgeny V. Kozhanov, ulitsa Masanchi, 79 "B", kv. 17; Vyacheslav D. Stupnik, ulitsa Transportnaya, 44, and Vladimir V. Valov, ulitsa Astronomicheskaya, 82, kv. 37, all of Alma-Ata, U.S.S.R.

Filed Jul. 15, 1981, Ser. No. 283,786

Int. Cl.³ G01N *1/14*

U.S. Cl. 422—63 **5 Claims**

1. A micrometering liquid sample dispenser comprising:

a group of syringe samplers equal in number to the number of sample liquids being metered and dispensed and having cylinders and piston with piston rods;

pipes for conveying the sample liquids into a test tube, the pipes being equal in number to the number sample liquids

and adapted to communicate with outlets of corresponding aforesaid syringe samplers;

a stand accommodating said syringe samplers;

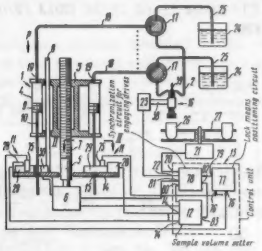
a drive for relative reciprocating displacement of the pistons and cylinders of said syringe samplers serving as a sample volume regulator and kinematically linked with said stand;

a control unit having a set of outputs;

a sample volume and timing setter incorporated into said control unit and having a set of outputs;

a drive for step-by-step rotation of a test tube tray having an output connected to a first output of said set of outputs of said control unit;

a drive for reciprocating the ends of the sample liquid dispensing pipes relative to the test tube, the drive having an output connected to a second output of said set of said control unit;



a group of piston rod locking means equal in number to the number of said syringe samplers, the locking means being intended for a programmable metering and dispensing the sample liquids and located in close proximity to said piston rods of said syringe samplers;

outputs of said piston rod lock means connected to said corresponding outputs of said sample volume and timing setter;

three-way valves equal in number to the number of sample liquids being measured and dispensed adapted to hydraulically communicate said corresponding pipes for conveying the sample liquids into a test tube;

pipes equal in number to the number of sample liquids;

containers for the sample liquids; and

a holder for holding the ends of said pipes for conveying the sample liquid being metered and dispensed to effect a programmable dispensing into a test tube.

4,351,800

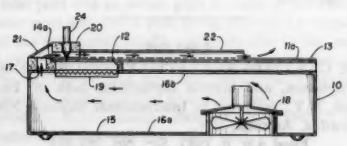
THIN LAYER PLATE CHROMATOGRAPHY APPARATUS

Reiner H. Kopp, Centerport, and Allen I. Panetz, Huntington, both of N.Y., assignors to Biochemical Diagnostics, Inc., Farmingdale, N.Y.

Filed Feb. 6, 1981, Ser. No. 232,134

Int. Cl.³ G01N *1/14, 31/08*

U.S. Cl. 422—70 **6 Claims**



1. Apparatus for the application of specimens to thin layer chromatography plates comprising a housing for supporting one or more plates, positioning stops for locating the plates in a precisely predetermined position, a holder for specimen applicators disposed above the plane of the plate and extending transversely across one end portion thereof and disposed in close proximity to the plane to define an air channel along the top surface of the plate and through which the tip portions of the applicators pass to reach the chromatography plate, said holder including means to mount a plurality of specimen applicators across the width of the plate, air duct means connecting the air channel to the interior of the housing and means in the housing to impel air through the air duct and air channel to pass around the tip portions of the applicators.

4,351,801

COMBUSTION APPARATUS FOR USE IN ELEMENTARY ANALYSIS

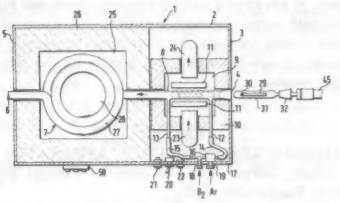
Rolf Bartke, Düsseldorf, Fed. Rep. of Germany, assignor to Antek Instruments GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,582

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3116049

Int. Cl.³ G01N *25/22, 31/12*

U.S. Cl. 422—78 **10 Claims**



1. A combustion apparatus for elementary analysis, particularly for nitrogen analysis, comprising a quartz tube extending from a receiving aperture for the medium to be analyzed through a digesting zone and a main combustion zone up to a discharge aperture, further comprising at least one oxygen supply connection with which the section of the quartz tube extending through the digesting zone is connected, a first heating device section adapted to permit the heating temperature in the digesting zone to be varied in accordance with a predetermined timing program, a second heating device section adapted to heat the main combustion zone and to keep it at an essentially constant temperature and a closure plug for the receiving aperture of said quartz tube, characterized in that, for use in the analysis of solid samples, each closure plug is provided, in a per se known manner, with a tray adapted to receive a solid sample, said receiving tray extending into the section of the quartz tube which is located in said digesting zone upon said plug being introduced into the receiving aperture, and that there is provided an automatic introducing device adapted successively or alternately to introduce said closure plugs, each of which is provided with a receiving tray.

4,351,802

HEADSPACE-SAMPLING APPARATUS

Michael A. Baylis, Totton; Peter Harris, and Stewart R. Massey, both of Southampton, all of England, assignors to British-American Tobacco Co., Ltd., London, England

Continuation of Ser. No. 14,607, Feb. 23, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,028

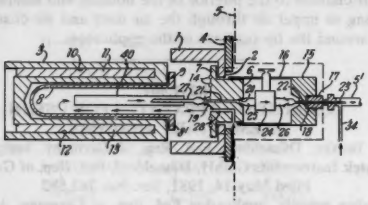
Claims priority, application United Kingdom, Feb. 28, 1978, 7920/78

Int. Cl.³ G01N *1/22*

U.S. Cl. 422—89 **6 Claims**

1. Headspace-sampling apparatus comprising; sampling body means which defines a closable sample chamber, means for mounting said apparatus on a gas chromatograph with the sample chamber exterior to the chromatograph, a removably

positioned solid sample in the chamber, first passage means extending substantially straight from said chamber to connection means for connecting said passage means, when the apparatus is so mounted, to the entry end of a chromatography column held in operative position in the gas chromatograph, a hollow needle the interior of which comprises part of said first passage means, means holding the needle in a stationary posi-



tion within the closed sample chamber and the solid sample, which it penetrates, contained therein, second passage means extending to said chamber, and connection means for connecting a source of gas to said second passage means and providing a gas-flow path within the body means from the second-named connection means through the chamber, the sample and the first passage means including the needle to the first-named connection means.

4,351,803

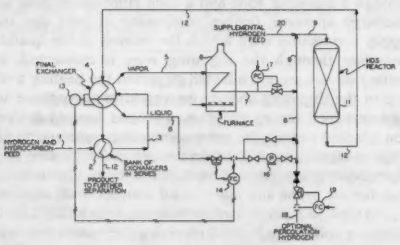
HYDROCARBON HEATING APPARATUS

John S. Olson, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 128,991, Mar. 10, 1980, Pat. No. 4,293,402. This application Jun. 5, 1981, Ser. No. 270,727

Int. Cl.³ B01D *1/00, 1/14;* **B01J** *8/00, 19/24*

U.S. Cl. 422—106 **2 Claims**



1. Apparatus for treating hydrocarbon containing feedstream comprising

(a) a hydrocarbon feed conduit connected to the feed intake side of

(b) a hydrocarbon preheater, the hydrocarbon outlet of which is connected to

(c) a liquid/gas separator having a gas outlet and a liquid outlet, the gas outlet of said liquid/gas separator being connected to

(d) the inlet of a hydrocarbon vapor super heater the outlet of which is connected to one of two inlets of

(e) a mixing unit, the second inlet of which is connected directly and without a furnace for heating the liquid to the liquid outlet of said liquid/gas separator and the outlet of the mixing unit being connected to the inlet of

(f) a hydrodesulfurization zone

(g) said hydrocarbon preheater and said liquid/gas separator being built as one heat exchanger the last stage of which constitutes the gas/liquid separator having a gas outlet and a liquid outlet, said heat exchanger having a first flow path and a second flow path arranged in indirect heat exchange relationship with each other

(h) said first flow path of said heat exchanger being connected with said hydrodesulfurization zone in such a manner as to allow at least a portion of the effluent of the hydrodesulfurization zone to flow through said first flow path, and said hydrocarbon feed conduit being connected to said second flow path.

4,351,804

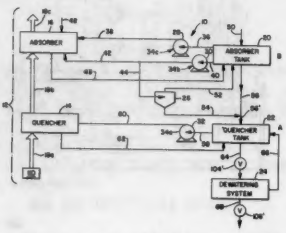
SULFUR DIOXIDE SCRUBBER WITH HYDROCLONE SEPARATOR

Edward L. Biedell, Scotch Plains, and Robert J. Ferb, Warren, both of N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Division of Ser. No. 957,674, Nov. 6, 1978, Pat. No. 4,250,152. This application Apr. 8, 1980, Ser. No. 138,415

Int. Cl.³ B01D *53/14, 53/34;* **B01J** *19/04*

U.S. Cl. 422—170 **1 Claim**



1. Apparatus for removing sulfur dioxide from flue gas comprising:

a quencher-absorber tower;

a flue gas quencher; and

a flue gas scrubber serially mounted in said tower;

a flue gas inlet for said tower in communication with said flue gas quencher;

gas outlet means for said tower in communication with the flue gas scrubber;

means for serially passing the flue gas first through the quencher and then through the scrubber;

an alkali reagent water slurry;

means for serially contacting the gas first in the quencher and then in the scrubber with the alkali/water slurry;

dewatering means for a portion of the partially spent alkali reagent water slurry;

said dewatering means comprising a hydroclone, a tangential inlet at the upper end of the hydroclone, a bottom outlet for discharging heavy particles from the hydroclone, a vortex finder mounted in the upper end of the hydroclone forming the light fraction discharge from the hydroclone, a slurry feed control valve for the tangential inlet, a heavy particle control valve for the bottom outlet and means for directing the lighter fraction discharged from the hydroclone into the alkali/water slurry for the gas quencher.

4,351,805

SINGLE GAS FLOW ELEVATED PRESSURE REACTOR

Arnold Reisman, and Melvin Berkenblit, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,591

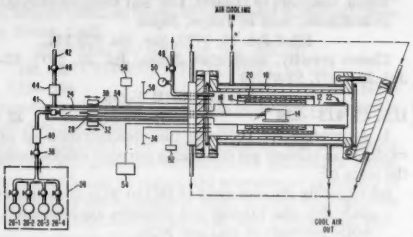
Int. Cl.³ F28D *21/00*

U.S. Cl. 422—202 **5 Claims**

1. In a reactor apparatus for oxidizing or annealing specimens of the type including a reaction tube containing said

specimen surrounded by a heating furnace and enclosed in a pressure chamber, the improvement consisting of;

a single source of pressurized gas connected to one end of said reaction tube for providing gas to react with said specimen,



and a retrograde closure mounted on the other end of said reaction tube to permit said gas to enter said surrounding pressure chamber and to prevent said gas in said pressure chamber from re-entering said reaction tube.

4,351,806

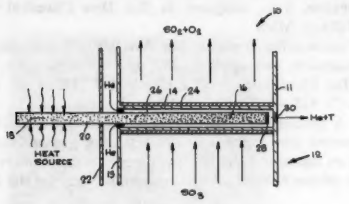
CATALYTIC CARTRIDGE SO_3 DECOMPOSER

Terry R. Galloway, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 208,218, Nov. 18, 1980. This application May 22, 1981, Ser. No. 266,249

Int. Cl.³ F28D *21/00*

U.S. Cl. 422—206 **12 Claims**



1. A cross-flow SO_3 decomposer for thermochemical hydrogen production, comprising:

a cartridge comprising a plurality of walls defining a chamber therebetween, and a cylindrical tube mounted in the chamber and extending through the chamber from one wall of the chamber to an opposing wall thereof, the outer surface of the cylindrical tube being coated with a catalyst for promoting SO_3 decomposition reactions;

means for heating the catalyst coated surface, the heating means extending into the cylindrical tube and in thermal proximity therewith, the heating means adapted to transfer heat into the cartridge for heating the catalyst to a sufficient temperature to promote SO_3 decomposition reactions; and

an inlet port and an outlet port in walls of the cartridge, the inlet port and outlet port being provided at opposite sides of the tube substantially perpendicular to the longitudinal axis of the tube, whereby SO_3 gas may be flowed throgh the inlet port in a direction substantially normal to the tube across the catalyst to contact the catalyst and thereby produce SO_3 decomposition into SO_2 and O_2 which are removable through the outlet port.

2. An axial-flow SO_3 decomposer for thermochemical hydrogen production, comprising:

a cartridge comprising a pair of concentric cylindrical tubes and a pair of end walls, the tubes being mounted at each end to an end wall, the concentric tubes and end walls defining an annular space therebetween, the outer surface of the inner concentric tube being coated with a catalyst for promoting SO_3 decomposition reactions;

means for heating the catalyst coated surface, the heating means extending into the inner concentric cylindrical tube and in thermal proximity therewith, the heating means adapted to transfer heat into the cartridge to heat the catalyst to a sufficient temperature to promote SO_3 decomposition reactions; and

an inlet port and outlet port at opposing ends of the outer concentric tube whereby SO_3 gas may be flowed through the inlet port and through the annular space between the tubes in an axial direction with respect to the tubes to contact the catalyst and thereby produce SO_3 decomposition into SO_2 and O_2 which are removed through the outlet port.

4,351,807

PROCESS FOR SELECTIVE EXTRACTION OF METAL IONS FROM AQUEOUS SOLUTIONS AND EXTRACTING AGENTS SUITABLE FOR THAT PURPOSE

Martinus Tels, Eindhoven; Jan P. Lotens, Duiven, and Hendrikus P. M. Kivits, Eindhoven, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 52,415, Jun. 27, 1979, abandoned, which is a division of Ser. No. 907,704, May 9, 1978, Pat. No. 4,191,728, which is a continuation-in-part of Ser. No. 883,668, Mar. 6, 1978, abandoned. This application Nov. 21, 1980, Ser. No. 209,121

Claims priority, application Netherlands, Mar. 9, 1977, 7702517

Int. Cl.³ C01G *3/00, 51/00*

U.S. Cl. 423—24 **7 Claims**

1. A process for the selective extraction of copper metal ions from an aqueous solution containing copper and cobalt metal ions, the process comprising the steps of:

a. contacting said aqueous solution at a pH of 4.0 to 6.0 with a substantially immiscible organic extraction agent essentially composed of

a mixture of (1) oleic acid, or (2) oleic acid, and

at least one other unsaturated fatty acid with a (cyclo)aliphatic oxime of from 6 to 12 carbon atoms

thereby formimg a copper-ion rich organic phase and a cobalt-ion rich aqueous phase, and

b. extracting substantially all of the copper, recovering and removing said copper as a copper salt from the organic phase.

4,351,808

AUTOCLAVE SODA DIGESTION OF SCHEELITE CONCENTRATES

Leo W. Beckstead, Arvada; Dale K. Huggins, and Paul B. Queneau, both of Golden, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jan. 19, 1981, Ser. No. 225,914

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—61 **18 Claims**

1. A process for the soda digestion of scheelite concentrates containing by weight about 2% to 40% WO_3 and gangue minerals including at least about 2% silica which comprises:

forming a slurry of a scheelite concentrate in an aqueous sodium carbonate solution of an initial concentration ranging from about 50 gpl to 200 gpl at a Na_2CO_3/WO_3 weight ratio of about 0.9 to 1.6,

and then digesting said slurry in an autoclave at an elevated pressure and at a temperature ranging from about 180° C. to 310° C.,

said digestion being such that the initial concentration of the Na_2CO_3 solution employed is substantially inversely cor-

related to the digestion temperature and substantially directly correlated to the Na_2CO_3/WO_3 weight ratio, such as to effect dissolution of at least about 95% of the WO_3 in the concentrate and provide a pregnant liquor containing substantially all of said WO_3 while inhibiting dissolution of gangue minerals.

4,351,809

PROCESS FOR REDUCING PHOSPHATE ORE

Joseph A. Megy, Mission Viejo, and Robert A. Hard, Laguna Beach, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed May 20, 1981, Ser. No. 265,305
Int. Cl.³ C01B *25/01*
U.S. Cl. 423—167 **20 Claims**

1. A process for reducing phosphate ore including fluoride and alumina impurities, comprising the steps of:

beneficiating the phosphate ore to reduce the alumina impurities therein to less than about three percent by weight, said fluoride impurities remaining in the beneficiated phosphate ore;

mixing the beneficiated phosphate ore containing said fluoride impurities with silica and solid carbonaceous material in amounts to produce a feed mixture having a CaO/SiO_2 mole ratio within the range of from about 2.5 to about 5.0;

forming the feed mixture into agglomerates; and,

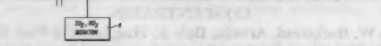
heating, by exposure to a flame, a porous bed of agglomerated feed mixture particles to a temperature sufficient to reduce the phosphate in the feed mixture by reaction with carbonaceous material to form elemental phosphorus vapor without substantial melting of the porous bed.

4,351,810

METHOD FOR REMOVING SULFUR DIOXIDE FROM A GAS STREAM

Richard I. Martinez, Gaithersburg, and John T. Herron, Germantown, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 9, 1981, Ser. No. 281,745
Int. Cl.³ C01B *21/00, 17/00, 17/74*
U.S. Cl. 423—235 **16 Claims**



1. A method of removing SO_2 from an industrial flue gas, exhaust gas or waste gas stream, which comprises the steps of:

(a) determining the moisture content of the gas, and, where the moisture content is more than about 1000 times the SO_2 concentration, reducing the moisture content below about 1000 times the SO_2 concentration;

(b) contacting the gas stream with an amount of a stabilized Criegee intermediate sufficient to scavenge the SO_2 in the gas and form a Criegee-SO_2 adduct, the diversion of the stabilized Criegee intermediate by water being less than about 10%;

(c) hydrolysing the Criegee-SO_2 adduct at an H_2O concentration of at least 2 times the initial SO_2 concentration, to convert the adduct directly to H_2SO_4 and oxoalkane; and

(d) separating the resultant H_2SO_4 from the gas stream.

4,351,811

PROCESS FOR REDUCING AN ELIMINATING NITROGEN OXIDES IN AN EXHAUST GAS

Shinpei Matsuda; Akira Kato; Shigeo Uno, all of Hitachi; Youichi Sakuta, Katsuta, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki-Kaisha, both of Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,111
Claims priority, application Japan, Jul. 20, 1977, 52-86049; Jul. 22, 1977, 52-87299
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—239 **15 Claims**

1. A process for reducing the concentration of nitrogen oxides in an exhaust gas containing nitrogen oxides, comprising the steps of:

(a) adjusting the mol ratio of NO to NO_2 in the exhaust gas such that the exhaust gas contains approximately equal molar amounts of NO and NO_2,

(b) mixing the exhaust gas having the adjusted mol ratio of NO to NO_2 with an ammonia-containing gas, in which the mol ratio of ammonia to the total of NO and NO_2 in the exhaust gas is about 0.8 to 2:1, and

(c) contacting the resultant mixture with a metallic oxide catalyst at a temperature in the range of 100°–550° C., thereby to reduce nitrogen oxides into nitrogen gas and water, said metallic oxide catalyst containing titanium oxide as its first constituent and an oxide of at least one element selected from the group consisting of iron, copper, nickel, cobalt, molybdenum, tungsten, vanadium, chromium and cerium as its active component.

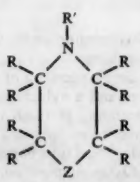
4,351,812

HYDROLYSIS OF CARBON OXYSULFIDE WITH MORPHOLINES AND PIPERAZINES

Glenn D. Correll, Birdsboro, Pa., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 936,675, Aug. 24, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 174,999
Int. Cl.³ C01B *17/00;* C02B *1/18;* C01B *31/20, 17/66*
U.S. Cl. 423—243 **23 Claims**

1. A process for hydrolyzing COS to H_2S and CO_2 which comprises contacting a COS-containing gas or liquid stream with an aqueous N-heterocyclic compound solution of one or more of the N-heterocyclic compounds having the formula:



wherein Z is an oxygen atom or

each R is independently a hydrogen atom or an alkyl group of 1–2 carbon atoms, R′ is the 2-amino ethyl group when Z is

and R′ is a hydrogen atom when Z is an oxygen atom wherein said solution contains an amount of said heterocyclic compound sufficient to hydrolyze the COS.

4,351,813

PROCESS FOR PRODUCING PHOSPHORUS PENTOXIDE OR PHOSPHORUS OR PHOSPHORIC ACID

Joseph A. Megy, Mission Viejo, and Robert A. Hard, Laguna Beach, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed May 20, 1981, Ser. No. 265,307
Int. Cl.[3] C01B 25/12, 25/16, 25/01, 25/02
U.S. Cl. 423—304 13 Claims

1. A process for reducing phosphorus pentoxide contained in phosphate ores comprising the steps of:

heating, by exposure to a flame, a porous bed comprising phosphate ore and solid carbonaceous material to a temperature sufficient to reduce the phosphorus pentoxide in the phosphate ore by reaction with the solid carbonaceous material to form carbon monoxide and phosphorus; and,

purging the porous bed with an inert gas in order to drive the reaction between the phosphorus pentoxide and the solid carbonaceous material towards complete reduction of the phosphorus pentoxide by removal of carbon monoxide from the porous bed, said inert gas being substantially nonreactive with the phosphorus pentoxide, carbonaceous material, phosphorus and the carbon monoxide.

4,351,814

HYDROTALCITES HAVING A HEXAGONAL NEEDLE-LIKE CRYSTAL STRUCTURE AND PROCESS FOR PRODUCTION THEREOF

Shigeo Miyata, and Akira Okada, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 218,017
Int. Cl.[3] C01G 39/00
U.S. Cl. 423—306 4 Claims

1. Hydrotalcites having a hexagonal needle-like crystal structure and having a length-to-diameter ratio, determined by an electron microscope at a magnification of 1000 X, of at least about 10, said hydrotalcites having the following formula:

$$Mg_{1-x_1}M_{x_1}{}^{3+}(OH)_{2+x_1-ny}A_y{}^{n-}.m_1H_2O \quad (1)$$

wherein M^{3+} represents a trivalent metal cation, A^{n-} represents an anion having a valence of n, and x_1, y and m_1 are numbers satisfying the following conditions:

$$0<x_1\leqq 0.6,$$

$$0<y\leqq 0.5,$$

$$0\leqq m_1\leqq 2.$$

4. A process for producing a hydrotalcite having a hexagonal needle-like structure and having a length-to-diameter ratio, determined by an electron microscope at a magnification of 1000 X, of at least 10, said hydrotalcite having the following formula:

$$Mg_{1-x_1}M_{x_1}{}^{3+}(OH)_{2+x_1-ny}A_y{}^{n-}.m_1H_2O \quad (1)$$

wherein M^{3+} represents a trivalent metal cation, A^{n-} represents an anion having a valence of n, and x_1, y and m_1 are numbers satisfying the following conditions:

$$0<x_1\leqq 0.6,$$

$$0<y=0.5,$$

$$0<m_1\leqq 2;$$

said process comprising contacting a basic magnesium compound having a needle-like crystal structure and expressed by the following formula (2):

$$Mg(OH)_{2-n'x_2}A_{x_2}{}^{n'-}.m_2H_2O \quad (2)$$

wherein $A^{n'-}$ represents a monovalent or divalent anion, n' is 1 or 2, and x_2 and m_2 are numbers satisfying the following conditions:

$$0.2\leqq x_2\leqq 0.5,$$

$$0<m_2\leqq 2,$$

with a compound capable of providing a trivalent metal cation and being soluble in a liquid reaction medium which is chemically inert and is a non-solvent for the basic magnesium compound, the contacting being carried out in said liquid reaction medium under conditions which do not cause a loss of the needle-like crystal form of the basic magnesium compound, while maintaining the ratio of M^{3+} to the sum of Mg and M^{3+} at $0<M^{3+}/(Mg+M^{3+})\leqq 0.6$ and the pH of the contacting system at not less than 9.

4,351,815

BATTERY CARBON BLACK

Fred E. Glasstetter, Yardley, Pa., and Frank J. Eckert, Monroe, La., assignors to Columbian Chemicals Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 47,960, Jun. 11, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,321
Int. Cl.[3] C09C 1/48
U.S. Cl. 423—445 9 Claims

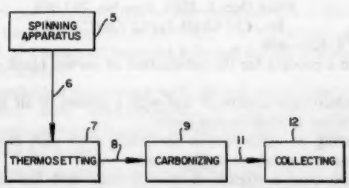
1. A carbon black having a geometric mean aggregate volume (Log Vg, nm^3) ranging from about 6.2 to abut 7.5, a dibutylphthalate absorption (DBPA) between about 210 and about 270 cc/100 g, a nitrogen surface area between about 30 and about 60 m^2/g and an average stacking height (L_c) of ordered graphitic layer segments ranging from about 2.7 to about 3.7 nm.

4,351,816

METHOD FOR PRODUCING A MESOPHASE PITCH DERIVED CARBON YARN AND FIBER

David A. Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 17, 1980, Ser. No. 217,438
Int. Cl.[3] D01F 9/12
U.S. Cl. 423—447.4 12 Claims



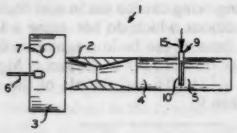
1. A method for producing a mesophase pitch derived carbon yarn, comprising the steps of:

forming a plurality of mesophase pitch fibers to define a mesophase pitch yarn;
thermosetting said mesophase pitch yarn to produce a thermoset yarn;
winding said thermoset yarn onto a bobbin which is thermally and mechanically stable at the tempertures used to pyrolyze and carbonize thermoset yarn and which is chemically compatible with said thermoset yarn at stages of transition of said thermoset yarn; and
subjecting said thermoset yarn on said bobbin to a predetermined heat treatment in an inert atmosphere to pyrolyze and carbonize said thermoset yarn;
whereby said carbon yarn can be unwound from said bobbin.

4,351,817
CARBON BLACK PROCESS

John E. Slagel, and Allen C. Howard, both of Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 764,665, Feb. 1, 1977, Pat. No. 4,138,217.
This application Dec. 27, 1978, Ser. No. 973,656
Int. Cl.³ C09C *1/50*
U.S. Cl. 423—450 **1 Claim**



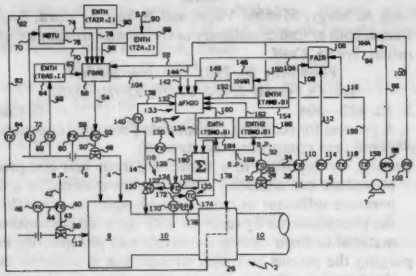
1. A method of producing carbon black comprising the steps of:
producing hot combustion gases;
contacting a make hydrocarbon with said thus produced hot combustion gases in a rection zone and thereby pyrolyzing said make hydrocarbon so as to produce an effluent comprising carbon black;
flowing said thus produced effluent along a quench zone having a longitudinal axis;
introducing quench liquid into said quench zone from a plurality of oppositely directed discharge openings lying in a plane generally transverse to the longitudinal axis of the quench zone and being spaced apart at different distances outwardly from the longitudinal axis of such quench zone and extending substantially across the cross section of said quench zone so as to form a curtain of quench liquid extending substantially across the entirety of the cross-section of the quench zone.

4,351,818
CARBON BLACK FURNACE PROCESS

Merle R. Likins, Jr., and Galen D. Stacy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 1, 1980, Ser. No. 211,984
Int. Cl.³ C01B *31/02*; C09C *1/48*
U.S. Cl. 423—450 **8 Claims**

1. In a process for the production of carbon black comprising
combusting a stream of fuel with a stream of air to form a stream of combustion gases;
reacting a carbonaceous feedstock with said combustion gases to produce carbon black;
introducing a stream of quench fluid into the stream of combustion gases to form a quenched effluent stream; and
passing the quenched effluent stream into an indirect heat exchange relationship with the stream of air and thereafter recovering carbon black; the improvement comprising:
controlling the rate of introduction of the quench fluid stream into the stream of combustion gases in response to

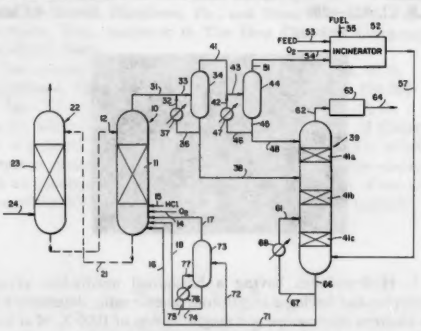


a first signal which is derived at least in part from the moisture content of the air entering the stream of air.

4,351,819
RECOVERY OF CHLORINE VALUES IN INTEGRATED PROCESS FOR OXYCHLORINATION AND COMBUSTION OF CHLORINATED HYDROCARBONS

Herbert Riegel, Maplewood, and Chiung-Yuan Huang, Glen Ridge, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jan. 26, 1981, Ser. No. 228,463
Int. Cl.³ C01B *7/01*; C07C *21/00*
U.S. Cl. 423—488 **7 Claims**



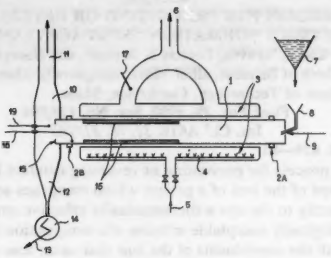
1. A process for integrating recovery of chlorine values from a chlorinated organic compound by combustion with an oxychlorination reaction, the improvement comprising:
combusting the chlorinated organic compound to recover the chlorine values therefrom essentially as hydrogen chloride;
contacting a gaseous combustion effluent from said combusting said aqueous hydrogen chloride to recover hydrogen chloride present in the gaseous combustion effluent by absorption;
employing hydrogen chloride recovered by the absorption in an oxychlorination reaction;
recovering from the oxychlorination reaction a gaseous effluent containing water vapor and hydrogen chloride;
cooling the gaseous effluent to condense aqueous hydrogen chloride, and
employing condensed aqueous hydrogen chloride in said absorption, whereby hydrogen chloride in the effluent from both the oxychlorination and combustion are recovered for use in the oxychlorination.

4,351,820

REGENERATION OF CHEMICAL RECONVERSION CATALYSTS USED IN A CYCLIC PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE AND APPARATUS THEREFOR

Pierre Thirion, Sassenage, France, assignor to Oxysynthese, Paris, France

Filed Aug. 11, 1980, Ser. No. 176,643
Claims priority, application France, Sep. 6, 1979, 79 22266
Int. Cl.³ C01B *15/023;* B01J *21/21*
U.S. Cl. 423—588 9 Claims



1. A process for the regeneration of aluminosilicate catalyst, comprising a gel of hydrated sodium aluminosilicate having an Al_2O_3 content of 55–63%, used in a cyclical process for the production of hydrogen peroxide by thermal treatment, comprising:

introducing the catalyst to be regenerated into a thermal enclosure at 650°–700° C. and progressively heating the catalyst in the thermal enclosure for 30 minutes to 2 hours by gradually increasing the temperature to a maximum temperature within the range of 700°–850° C. in the presence of a circulating oxidizing atmosphere.

3. A process according to claim 1, wherein the thermal enclosure is a rotary furnace which is inclined to the horizontal by 0.7° to 1°.

4. A process in accordance with claim 1 wherein the catalyst is continuously passed through said thermal enclosure and subjected to said progressive heating, and wherein the oxidizing atmosphere circulates cocurrently with the direction of movement of the catalyst.

4,351,821

PREPARATION OF GALLIUM OXIDE

Bernard Boudot, Paris; Jean Grosbois, L'Isle Adam, and Michel Pajot, Salindres, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 16, 1981, Ser. No. 274,231
Claims priority, application France, Jun. 27, 1980, 80 14308
Int. Cl.³ C01G *15/00*
U.S. Cl. 423—624 26 Claims

1. A process for the preparation of gallium oxide, Ga_2O_3, comprising (i) admixing, under stirring, a solution of a gallium salt with a base to convert said salt into gallium hydroxide, $Ga(OH)_3$; (ii) aging said gallium hydroxide reaction medium at elevated temperatures to effect precipitation therefrom of a gallium oxide/hydroxide fraction, GaO(OH); (iii) next filtering said gallium oxide/hydroxide fraction from said precipitation medium; (iv) drying and (v) calcining said filtered precipitate to convert same into said gallium oxide, Ga_2O_3, with said oxide/hydroxide fraction (vi) being washed either before or after said filtration step (iii).

4,351,822

QUANTITATIVE TESTING FOR VITAMIN B_{12}

Robert H. Allen, Englewood, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 893,524, Apr. 4, 1978, Pat. No. 4,188,189. This application Aug. 24, 1979, Ser. No. 69,257
The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.
Int. Cl.³ G01N *33/56, 33/58*
U.S. Cl. 424—1 25 Claims

1. A radioisotope dilution assay method of measuring the vitamin B_{12} (cobalamin) level in a sample which may also contain vitamin B_{12} analogue comprising: contacting said sample with a known amount of radioisotope of vitamin B_{12} and with an assay composition, said assay composition including an active component of binding protein which is substantially specific to vitamin B_{12} and substantially non-reactive with vitamin B_{12} analogue, wherein one or more binding protein which is non-specific to vitamin B_{12} may be present in the precursor of said assay composition and wherein any said non-specific binding protein has been rendered substantially inactive or inoperative as to its ability to bind with vitamin B_{12}, said assay composition being substantially free of any other substance which is present in a form in which it can react with vitamin B_{12} and any vitamin B_{12} analogue which may be present in said to-be-assayed sample.

4,351,823

DIAGNOSIS OF TUMORS OR BACTERIAL INFECTIONS HAVING β-GLUCURONIDASE ACTIVITY

David Rubin, c/o Israel Medical Foundation, P.O. Box 3592, Jerusalem, Israel, assignor to Adolf W. Schwimmer, Savyon; Irwin S. Schwartz, Tel Aviv and David Rubin, Jerusalem, all of, Ill.X

Continuation-in-part of Ser. No. 89,888, Oct. 31, 1979, Pat. No. 4,337,760, which is a continuation-in-part of Ser. No. 11,619, Feb. 12, 1979, Pat. No. 4,327,074, and a continuation-in-part of Ser. No. 951,270, Oct. 13, 1978, and a continuation-in-part of Ser. No. 951,269, Oct. 13, 1978. This application Jul. 18, 1980, Ser. No. 172,448
Int. Cl.³ A61K *49/00;* C12Q *1/04, 1/44;* G01N *33/50*
U.S. Cl. 424—9 11 Claims

1. A method for diagnosing the presence of tumors or bacterial infections having β-glucuronidase activity, in a patient, comprising:

injecting a non-toxic conjugated glucuronide of an aglycone, which aglycone, in the free state thereof, differs in color, color intensity, or fluorescence from the conjugated glucuronide thereof;

collecting the urine of the patient for a period of time sufficient to permit most of the injected glcuronide to be expelled from the body if it is not retained therein; and

determining the amount of glucuronide present in the collected urine by deconjugating the glucuronide in a sample of the urine and comparing the color, color intensity or fluorescence of the aglycone with a standard curve, thus indicating the quantity of aglycone in the sample;

whereby, if it appears that a substantial amount of glucuronide has been retained in the body, this is a positive indication of a tumor or bacterial infection having β-glucuronidase activity.

6. A method in accordance with claim 1, wherein prior to or concurrent with administration of the glucuronide a hyperacidifying agent is added to hyperacidify any tumor cells which may be present.

7. A process in accordance with claim 1 or claim 6, wherein previous to or concurrent with administration of the glucuronide an alkalinizing agent is added in an amount sufficient to maintain the pH level of the non-tumor tissues of the patient at approximately 7.4 during the glucuronide treatment.

4,351,824
POLYSTYRENE LATEX REAGENTS, METHODS OF PREPARATION, AND USE IN IMMUNOLOGICAL PROCEDURES

Harris I. Lehrer, Long Beach, Calif., assignor to ICL Scientific, Fountain Valley, Calif.

Filed Feb. 5, 1981, Ser. No. 231,683
Int. Cl.³ G01N *33/54, 33/68*
U.S. Cl. 424—12 **30 Claims**

1. A method for producing stable sensitized polystyrene latex particles useful as a diagnostic reagent in immunological procedures, the method comprising the steps of:

(i) coating a polystyrene latex particle with a water-soluble protein;

(ii) adsorbing a substantially methylated serum albumin onto the particle to form a matrix on the surface of the particle; and

(iii) non-covalently binding a substantially negatively-charged, polymeric compound, having antigenic sites, to the matrix whereby a sensitized particle is made;

wherein a mixture of sensitized particles in solution agglutinates in the presence of antibodies capable of binding antigenic sites of the polymeric compound, but does not exhibit significant auto-agglutination tendencies.

9. A method of making an immunological reagent for the in vitro diagnosis of rheumatic, autoimmune diseases, the method comprises adsorbing a water-soluble albumin and a substantially methylated bovine serum albumin onto surfaces of polystyrene latex beads, non-covalently binding a nuclear component to the methylated bovine serum albumin on the beads' surfaces, whereby the beads are sensitized with the nuclear component, and placing the beads in a preservative suspension, wherein the sensitized beads do not agglutinate in the presence of normal serum, but agglutinate in the presence of serum containing significant amounts of autoimmune antibodies.

18. A method for producing a reagent capable of agglutinating an aliquot of serum from a patient suffering from serum lupus erythematosus, the method comprising the steps of:

(i) combining 1 volume of a concentrated suspension of polystyrene latex beads, with 0.2 volumes of from about 10 micrograms/ml to 100 mg/ml bovine serum albumin in solution, and stirring;

(ii) adding 0.5 volumes of from about 10 micrograms/ml to 50 mg/ml methylated bovine serum albumin in solution, and stirring;

(iii) mixing in about 10 volumes of from about 50 micrograms/ml to about 5000 micrograms/ml, native deoxyribonucleic acid in solution, the deoxyribonucleic acid (DNA) preferably having a relative viscosity of about 1.2 to about 4.0, and stirring;

(iv) washing the beads by centrifugation to separate the beads from unbound albumins or deoxyribonucleic acid; and

(v) storing the washed beads as a suspension, containing preservatives.

4,351,825
PROCESS FOR THE PREPARATION OF TABLETS WITH RETARDED LIBERATION OF THE ACTIVE AGENT IS PREDETERMINED

Gunnar A. Sothmann, Kirkkonummi, and Esko V. Marttila, Helsinki, both of Finland, assignors to Orion-yhtymä Oy, Finland

Filed Jan. 14, 1980, Ser. No. 111,962
Claims priority, application Finland, Feb. 2, 1979, 790350
Int. Cl.³ A61K *9/22, 9/24, 9/52*
U.S. Cl. 424—19 **3 Claims**

1. Process for the preparation of controlled release tablets containing an active agent comprising:

(a) granulating the active agent with an organic solvent solution or a water dispersion of a copolymerizate of acrylic and methacrylic acid esters containing quaternary ammonium groups or an anionic copolymerizate of methacrylic acid and methyl ester of methacrylic acid;

(b) mixing the granules with an ester of a fatty acid containing 10 to 30 carbon atoms, said ester being present in an amount less than 15% of the total weight of the mixture whereby the granules are coated with said ester; and

(c) compressing the resulting mixture into tablets whereby the tablets release the active agent at a rate which is substantially independent of the compression pressure.

4,351,826
PROCESS FOR PREVENTING OR REVERSING CATARACT FORMATION USING ACRYLAMIDES

John I. Clark, Newton; Loretta S. Mengel, and George B. Benedek, both of Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 29, 1980, Ser. No. 125,994
Int. Cl.³ A61K *31/78, 31/165*
U.S. Cl. 424—81 **2 Claims**

1. A process for preventing or reversing cataract formation in the eye of the lens of a patient which comprises administering directly to the eye a therapeutically effective amount of a physiologically acceptable solution of a composition that interacts with the constituents of the lens that cause lens opacification in order to clarify the lens, said composition being selected from the group consisting of an acrylamide, a mixture of an acrylamide and an aldehyde, and a mixture of an acrylamide and a glycol.

4,351,827
NOVEL POLYVALENT VIRUS VACCINE

Gosse Bijlenga, La Tour de Salvagny, France, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Jul. 14, 1980, Ser. No. 168,332
Claims priority, application United Kingdom, Jul. 17, 1979, 7924915
Int. Cl.³ A61K *39/205, 39/175*
U.S. Cl. 424—89 **24 Claims**

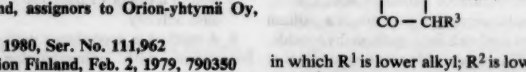
1. A process for the preparation of a polyvalent virus vaccine comprising a live rabies virus and a live canine distemper virus substantially free from material emanating from more than one type of tissue cell used to propagate the viruses comprising first propagating at least one living rabies virus in a single cell and then propagating at least one living canine distemper virus in the same single cell and preparing the polyvalent vaccine from the propagation product.

4,351,828
N-SUBSTITUTED CYCLOPEPTIDE DERIVATIVES

Amedeo Failli, St. Laurent; Hans U. Immer, Mount Royal, and Manfred K. Götz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 941,827, Sep. 11, 1978, Pat. No. 4,237,045.
This application Jun. 30, 1980, Ser. No. 164,663
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 **7 Claims**

1. A compound of formula I:



(I)

in which R^1 is lower alkyl; R^2 is lower alkyl or cyclo(lower)alkyl, R^3 is a neutral amino acid side chain selected from hydrogen or lower alkyl and Y is a peptide residue of the formula NHCH(R^4)CO—NHCH(R^5)CO—NHCH(R^6)CO—NHCH(R^7)CO—NHCH(R^8)CO wherein R^4 is hydrogen, lower alkyl or benzyl; R^5, R^6 and R^7 each independently is hydrogen or lower alkyl and R^8 is hydrogen, lower alkyl or 2-(methylthio)ethyl.

4,351,829

USE OF POLYPEPTIDES AS ANALGESIC DRUGS

Gerhard Zetler, Lübeck, Fed. Rep. of Germany; Alessandro Rossi, Barzini, and Chiara De Paolis, Milan, both of Italy, assignors to Farmitalia Carlo Erba Spa, Milan, Italy

Filed Sep. 26, 1980, Ser. No. 191,146
Int. Cl.[3] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 4 Claims

1. A method of inducing analgesia in animal and human patients suffering from severe pains selected from biliary and renal colic pains, pains caused by peripheral vascular diseases of the extremities, migraine chronic pains in cancer diseases, post-operatory-, traumatological-, large burns-, myocardial infarction- and angina pectoris pains, which comprises administering to the patient in need an effective amount of a polypeptide selected from ceruletide and salts thereof.

4,351,830

POLYMERIC COMPOUND, MF-300, WITH PROTECTIVE ACTIVITY AGAINST BACTERIAL INFECTIONS AND ITS PREPARATION

Takeo Miyazawa; Takahiro Ishii, both of Tokyo; Yuzo Kazuno, Hachioji; Eiichi Akita, Yokohama; Yujiro Yamada, Yokohama, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,609
Claims priority, application Japan, Jun. 17, 1980, 55/80847
Int. Cl.[3] A61K *31/73*; C07H *15/22*
U.S. Cl. 424—180 4 Claims

1. A polymeric compound, MF-300, which is obtained by reacting 1 to 36 moles crotonoyl chloride per mole of ribostamycin, concentrating the reaction product and recovering therefrom the compound as a fraction having a range of molecular weights of 10,000～100,000 when measured by ultrafiltration method and which has the following properties:

(1) Elemental analysis: C, 48.52±2.16%; H, 7.24±0.24%; N, 8.04±1.02%; Cl, 5.05±0.3%;

(2) Molecular weight: 10,000～100,000, when measured by ultrafiltration; 15,000～70,000, when measured by ultracentrifuge;

(3) Appearance: Pale yellow, amorphous powder;

(4) Decomposition point: 170°～200° C.

(5) Specific rotation: $[\alpha]_D^{25}+40.4°\pm7.3°$ (c 1.0, H_2O);

(6) Infrared absorption: 3400, 2940, 1660, 1630, 1550 cm^{-1};

(7) Ultraviolet absorption: No specific maximum absorption;

(8) NMR spectrum: 1.0～1.5, 1.8～2.1, 3.2～4.2, 5.2～5.4, 5.6～6.3, 6.5～7.2 ppm;

(9) Nature of aqueous solution: pH 4～6 (1% aqueous solution)

(10) Solubility: Soluble in water and methanol; Insoluble in ethanol, chloroform, acetone and petroleum ether;

(11) Color reaction: Positive to anthrone and Molisch reactions; Weakly positive to ninhydrin and biuret reactions; Negative to Tollens reaction.

4. A pharmaceutical composition for use to protect mammals against bacterial infections caused by bacteria of genus Pseudomonas, comprising as active ingredient an effective amount of the compound MF-300 defined in claim 1 in combination with a pharmaceutically acceptable carrier or adjuvant.

4,351,831

PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING ISOXSURPINE AND CHOLINE

John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Oct. 27, 1979, abandoned, which is a continuation of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application Jan. 30, 1981, Ser. No. 229,704
Int. Cl.[3] A61K *31/685*
U.S. Cl. 424—199 12 Claims

1. The process of reducing or eliminating undesirable side effects of a drug administered to a human which side effects result from inadequate release of brain acetylcholine, said drug being selected from the group consisting of isoxsuprine and dihydroergotamine, which comprises administering concomitantly with the drug an amount of a compound effective to release adequate amounts of brain acetylcholine and to raise the blood concentration of choline in the human to between about 10 and about 50 n moles/ml selected from the group consisting of choline, a salt of choline, lysolecithin and acyglycerophosphocholine, glycerophosphatidyl choline and mixtures thereof.

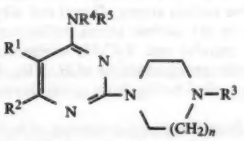
4,351,832

2-(PIPERAZINYL)-4-PYRIMIDINAMINES

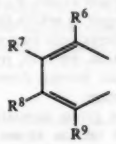
Sumanas Rakhit, Dollard des Ormeaux, and Jehan F. Bagli, Kirkland, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 141,548, Apr. 18, 1980, Pat. No. 4,333,937. This application Mar. 20, 1981, Ser. No. 245,798
Int. Cl.[3] C07D *403/14*, *417/14*, *498/04*
U.S. Cl. 424—246 17 Claims

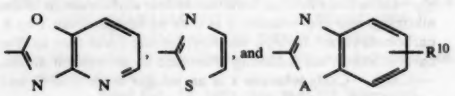
1. A compound of the formula



in which R^1 and R^2 are hydrogen, or R^1 and R^2 together form a chain of the formula



wherein R^6, R^7, R^8 and R^9 each is hydrogen or lower alkoxy; R^3 is selected from the group consisting of



wherein R^{10} is hydrogen, halo, lower alkyl, lower alkoxy, hydroxy, 1-oxo(lower)alkoxy or $NR^{11}R^{12}$ wherein R^{11} and R^{12} each is hydrogen or lower alkyl; A is NR^{13} wherein R^{13} is lower alkyl; R^4 and R^5 each is hydrogen or lower alkyl; and n

is 1 or 2; or a therapeutically acceptable acid addition salt thereof.

9. A pharmaceutical composition for treating hypertension, which comprises a compound of claim 1, and a pharmaceutically acceptable carrier therefor.

11. A method of treating hypertension in a hypertensive mammal, which comprises administering to said mammal an antihypertensive effective amount of a compound of claim 1, in combination with an effective amount of a second therapeutic agent comprising a diuretic, an antihypertensive agent of a combination of a diuretic and an antihypertensive agent.

4,351,833

9-AMINO-1-HYDROXYOCTAHYDROBENZO[C]QUINOLINES AND DERIVATIVES THEREOF AS ANALGESICS AND ANTI-EMETICS

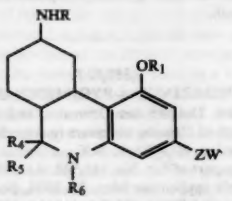
Michael R. Johnson, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 173,207, Jul. 28, 1980, Pat. No. 4,309,545. This application Aug. 27, 1981, Ser. No. 296,745

Int. Cl.³ C07D 221/12

U.S. Cl. 424—248.5 **26 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein R is hydrogen, COR_7 or SO_2R_8 where R_7 is a member selected from the group consisting of hydrogen, alkyl, having from one to five carbon atoms; alkenyl and alkynyl each having from two to six carbon atoms, trifluoromethyl, benzyl, furyl, thienyl, pyridyl and $R_9C_6H_4$ where R_9 is a member selected from the group cosisting of H, NH_2, F, Cl, Br, CH_3 and OCH_3; R_8 is alkyl having from one to five carbon atoms or $R_9C_6H_4$;

R_1 is selected from the group consisting of hydrogen, benzyl, benzoyl, alkanoyl having from one to five carbon atoms and $—CO—(CH_2)_p—NR_2R_3$ wherein p is 0 or an integer from 1 to 4; each of R_2 and R_3 when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_2 and R_3 when taken together with the nitrogen to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from one to four carbon atoms in the alkyl group;

R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms and $—(CH_2)_z—C_6H_5$ wherein z is an integer from 1 to 4;

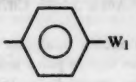
R_5 is selected from the group consisting of hydrogen, methyl and ethyl;

R_6 is selected from the group consisting of hydrogen, $—(CH_2)_y—$carbalkoxy having from one to four carbon atoms in the alkoxy group and wherein y is 0 or an integer from 1 to 4, carbobenzyloxy, formyl, alkanoyl having from two to five carbon atoms, alkyl having from one to six carbon atoms, $—(CH_2)_x—C_6H_5$ wherein x is an integer from 1 to 4; and $—CO(CH_2)_{x-1}—C_6H_5$;

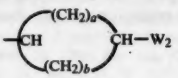
Z is selected from the group consisting of

(a) alkylene having from one to nine carbon atoms;

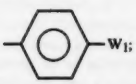
(b) $—(alk_1)_m—X—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and W is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



whrerein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

23. A method for producing analgesia in a mammalian subject in need of such treatment which comprises orally or parenterally administering to said subject an analgesic-producing amount of a compound according to claim 1.

4,351,834

PESTICIDE

Hironobu Takahashi; Masamitus Honda; Yasushi Murakami, all of Tokyo, and Yoshitaka Iwane, Yokohama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 32,091, Apr. 20, 1979, Pat. No. 4,234,582. This application May 15, 1980, Ser. No. 150,182

Claims priority, application Japan, May 10, 1978, 53/54436; Jul. 11, 1978, 53/83522

Int. Cl.³ A01N 43/64, 43/08

U.S. Cl. 424—249 **8 Claims**

1. A pesticidal composition containing as effective ingredients a trialkyl isocyanurate of the formula:

(wherein R is an alkyl group having 2 to 4 carbon atoms) and a pyrethroid insecticide selected from the group consisting of (+)-3-allyl-2-methyl-4-oxo-2-cyclopentenyl-(+)-trans-chrysanthemate, (±)-3-allyl-2-methyl-4-oxo-2-cyclopentenyl-(±)-cis/trans-chrysanthemate, 5-benzyl-3-furylmethyl-(±)-cis/-trans-chrysanthemate, 5-benzyl-3-furylmethyl-(±)-cis/trans-chrysanthemate, N-(3,4,5,6-tetrahydrophthalimido)-methyl-(±)-cis/trans-chrysanthemate, and 3-phenoxybenzyl-(+)-cis/-trans-chrysanthemate, said isocyanaurate and said pyrethroid being present in insecticidal amounts with said pyrethroid insecticide being present in an amount of 2 to 40% by weight of said trialkyl isocyanurate.

4,351,835

METHOD FOR PREVENTING BODY FAT DEPOSITION IN MAMMALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to Montefiore Hospital, Pittsburgh, Pa.

Filed Apr. 1, 1981, Ser. No. 249,812
Int. Cl.[3] A61K *31/12, 31/19, 31/525*
U.S. Cl. 424—252 9 Claims

1. A method for controlling weight in a mammal, which comprises administering orally to said mammal a therapeutic mixture of pyruvate and dihydroxyacetone in an effective amount to induce a weight loss or to reduce an expected weight gain from a given diet.

8. A method for increasing the glycogen concentration in the liver of a mammal, which comprises administering orally to said mammal effective amounts of a mixture of pyruvate and dihydroxyacetone for a period sufficient to increase glycogen concentration above normal.

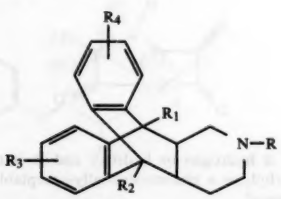
4,351,836

1,2,3,4,4A,5,10,10A-OCTAHYDRO-5,10-ORTHO-BENZENOBENZ[G]ISOQUINOLINES AND ANTIDEPRESSANT USE THEREOF

Parthasarathi Rajagopalan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

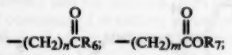
Filed Jul. 28, 1980, Ser. No. 172,991
Int. Cl.[3] A61K *31/47;* C07D *221/22*
U.S. Cl. 424—258 12 Claims

1. A compound of the formula



where

R is H; C_1–C_6 alkyl, optionally substituted with —OR_5, phenyl or 1-adamantyl;



or —$CH_2CH(C_6H_5)_2$;

R_1 and R_2 are both H, or, when R=H or CH_3, then one of R_1 and R_2 may be CH_3;

R_3 and R_4 are independently H, Cl, F or CH_3;

R_5 is H, CH_3 or phenyl;

R_6 is C_1–C_3 alkyl;

R_7 is H or C_1–C_4 alkyl;

n is 1, 2, 3 or 4; and

m is 0, 1, 2, 3 or 4;

provided that, when m=0, then R_7 is other than H; and pharmaceutically suitable acid and base salts thereof.

12. A method alleviating depression in mammals comprising administering to the mammal an antidepressive amount of a compound of any one of claims 1 to 10.

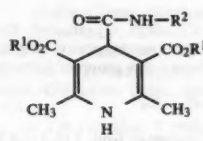
4,351,837

1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLATE-4-CARBOXAMIDE COMPOUNDS, COMPOSITIONS CONTAINING SAME AND METHOD OF USING SAME

Carsten Materne, Bonn, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,274
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022002
Int. Cl.[3] C07D *213/56, 401/12;* A61K *31/455*
U.S. Cl. 424—266 9 Claims

1. A compound which is a 1,4-dihydropyridine of the formula

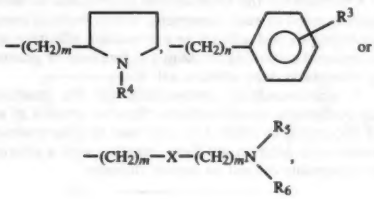


(I)

or a pharmaceutically acceptable salt thereof, in which,

R^1 denotes a straight-chain or branched hydrocarbyl radical with 1 to 4 carbon atoms and

R^2 denotes a



radical,

in which

n is 0, 1 or 2 and

R^3 denotes one or two radicals selected from methyl, hydroxyl and methoxy,

m is 1 or 2,

R^4 denotes an alkyl group with 1 to 4 carbon atoms,

R^5 and R^6 each independently denote an alkyl group with 1 to 4 carbon atoms and

X denotes a—CH_2— group or a hetero-atom, selected from —O— or —S—.

9. A method for lowering blood pressure in a warm-blooded animal which comprises administering to said animal a blood pressure lowering effective amount of an active compound according to claim 1.

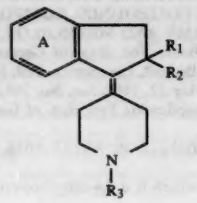
4,351,838

INDANE DERIVATIVES, PROCESS FOR THEIR PREPARATION, THEIR USE AS PHARMACEUTICALS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAID DERIVATIVES

Klaus Hasspacher, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 12, 1981, Ser. No. 233,707
Claims priority, application Switzerland, Feb. 13, 1980, 1170/80
Int. Cl.[3] A61K *31/445;* C07D *211/06*
U.S. Cl. 424—267 12 Claims

1. A compound of formula I



(I)

wherein

R_1 and R_2, independently, are C_{1-4}alkyl,

R_3 is hydrogen; C_{1-4}alkyl; C_{3-5}alkenyl; C_{7-10}phenylalkyl optionally substituted in the phenyl ring by halogen, C_{1-4}alkyl or C_{1-4}alkoxy; or a group of formula (a)

$$-(CH_2-CH_2-O)_n-R_4 \quad \text{(a)}$$

wherein n is an integer of from 1 to 3 and R_4 is hydrogen or a non-toxic acid residue which is removable by hydrolysis under physiological conditions, and

the ring A is mono-or-di-substituted by fluoro, chloro or C_{1-4}alkoxy groups,

in free base or in pharmaceutically acceptable acid addition salt form.

11. A method for the treatment or prophylaxis of asthma in a subject in need of such treatment, which method comprises administering to said subject an anti-asthma effective amount of a compound according to claim **1** in free base or pharmaceutically acceptable acid addition salt form.

12. A pharmaceutical composition for the treatment of asthma comprising an anti-asthma effective amount of a compound according to claim **1** in free base or pharmaceutically acceptable acid addition salt form, together with a pharmaceutically acceptable diluent or carrier therefor.

4,351,839

FUNGICIDAL 2-ARYL-2-1-H-AZOYL-(ALKYL)-GAMMA-BUTYROLACTONES

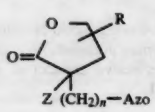
Hak-Foon Chan, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 30, 1981, Ser. No. 249,250

Int. Cl.[3] **A01N** *43/64, 43/50;* **C07D** *405/04, 405/06*

U.S. Cl. 424—269 **9 Claims**

1. A compound of the formula:



wherein

Z is

phenyl or naphthyl, optionally substituted with up to three substituents selected from

halogen, nitro, trihalomethyl, cyano, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsulfonyl, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl, or phenylsulfonyl;

R is

hydrogen, (C_1-C_{10})alkyl, (C_3-C_8)alkenyl, (C_3-C_8)alkynyl, or phenyl or naphthyl optionally substituted with up to three substituents selected from

halogen, nitro, trihalomethyl, cyano, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsulfonyl, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl, or phenylsulfonyl,

or phenyl-(C_1-C_4)alkyl or naphthyl-(C_1-C_4)alkyl the aromatic portion of which is optionally substituted with up to three substituents selected from

halogen, nitro, trihalomethyl, cyano, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsulfonyl, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl or phenylsulfonyl;

Azo is 1-H-imidazoyl, 1-H-1,2,4-triazoyl or 4-H-1,2,4-triazoyl;

n is 0 or an integer from 1 to 5;

or an agronomically acceptable acid addition salt or metal salt complex thereof.

8. A method of controlling phytopathogenic fungi which comprises applying to the plant, the plant habitat or the plant seed an effective amount of the compound of claim **1**.

4,351,840

ANTIBACTERIAL ESTERS OF RESORCINOL WITH AMPICILLIN AND PENICILLANIC ACID 1,1-DIOXIDE DERIVATIVES

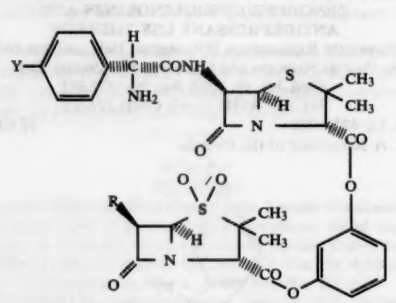
Donald K. Pirie, Uncasville, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 18, 1981, Ser. No. 303,456

Int. Cl.[3] **A61K** *31/43;* **C07D** *499/00, 499/68*

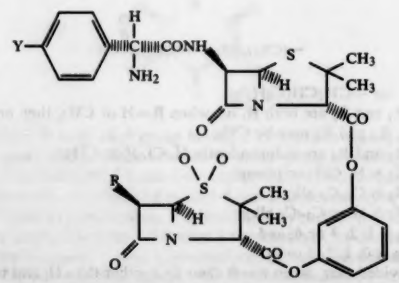
U.S. Cl. 424—271 **21 Claims**

1. A compound of the formula



wherein Y is hydrogen or hydroxy and R is hydrogen or hydroxymethyl, or a pharmaceutically-acceptable acid addition salt thereof.

6. A method of treating bacterial infections in a mammal which comprises treating said mammal with an antibacterially effective quantity of a compound of the formula



wherein Y is hydrogen or hydroxy and R is hydrogen or hydroxymethyl, or a pharmaceutically-acceptable acid addition salt thereof.

4,351,841

PHARMACEUTICAL PREPARATION AND METHOD OF TREATMENT

Friedrich-Johannes Kämmerer, Hochheim am Main, and Rudolf Schleyerbach, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

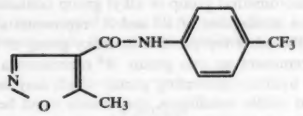
Division of Ser. No. 103,551, Dec. 13, 1979. This application Mar. 3, 1981, Ser. No. 239,986

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854439

Int. Cl.[3] A61K *31/42*

U.S. Cl. 424—272 2 Claims

1. A method for the treatment of inflammation, rheumatism or multiple sclerosis which comprises administering to a patient suffering therefrom an effective amount of 5-methylisoxazole-4-carboxylic acid-4-trifluoromethylanilide of the formula



4,351,842

N-CYCLOPROPYLISOINDOLINES

Richard J. Coles, Uxbridge, England, assignor to Glaxo Laboratories Limited, Greenford, England

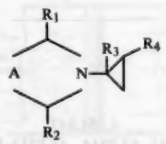
Continuation of Ser. No. 897,047, Apr. 17, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,929

Claims priority, application United Kingdom, Apr. 26, 1977, 17305/77

Int. Cl.[3] A61K *31/40*; C07D *209/44, 209/46, 209/60*

U.S. Cl. 424—274 34 Claims

1. A compound of the formula:



in which

A is a benzene ring or a carbocyclic aromatic group consisting of two benzene rings, the group A being linked to the nitrogen containing ring at two adjacent carbon atoms and the benzene ring or each benzene ring is unsubstituted or substituted by one or more substituents which may be the same or different, and are selected from the group consisting of alkyl containing 1–6 carbon atoms, phenyl, halogen, hydroxy, alkanoyloxy containing 1–6 carbon atoms in the alkanoyl portion or benzoyloxy, alkoxy containing 1–6 carbon atoms and a methylene dioxy group (O—CH_2—O—) which is connected to two adjacent positions in a ring;

R_1 and R_2 which may be the same or different, each represent hydrogen; an alkyl group which contains 1–6 carbon atoms and which is unsubstituted or substituted by hydroxy, alkanoyloxy containing 1–6 carbon atoms in the alkanoyl portion or benzoyloxy, alkoxy containing 1–6 carbon atoms, halogen, an alkylamino or dialkylamino group wherein the alkyl contains 1–6 carbon atoms; a hydroxycarbonyl or an alkoxycarbonyl group wherein the alkoxy contains 1–6 carbon atoms; and one of

R_3 and R_4 represents hydrogen, an alkyl group which contains 1–6 carbon atoms, and which is unsubstituted or substituted by hydroxy, alkanoyloxy containing 1–6 carbon atoms in the alkanoyl portion or benzoyloxy, alkoxy containing 1–6 carbon atoms, halogen, an alkylamino or dialkylamino group wherein the alkyl contains 1–6 carbon atoms; hydroxy, alkoxy, hydroxycarbonyl or alkoxycarbonyl group wherein each alkoxy contains 1–6 carbon atoms and the other R_3 and R_4 represents hydrogen, or a non-toxic physiologically acceptable salt, or hydrate thereof.

34. A method of treatment of a patient suffering from depression which comprises administering to the patient an effective amount of a compound as claimed in claim 1.

4,351,843

ANTIDIABETIC PYRROLECARBOXYLIC ACIDS

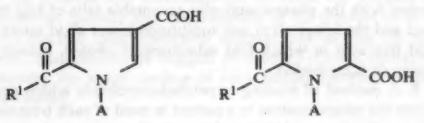
Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 128,119, Mar. 7, 1980, Pat. No. 4,282,242. This application Apr. 23, 1981, Ser. No. 256,933

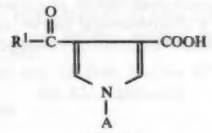
Int. Cl.[3] A61K *31/40*

U.S. Cl. 424—274 13 Claims

1. A method of lowering the level of blood glucose in a hyperglycemic mammal which comprises administering to said hyperglycemic mammal a compound selected from the group consisting of pyrrole carboxylic acids of structures IV, V and VI:



(IV) (V)



(VI)

wherein A is selected from the group consisting of hydrogen and (C_1–C_2)alkyl and R^1 is selected from the group consisting of benzyl; cyclohexyl; phenyl; phenyl monosubstituted in the 2-, 3-, or 4-position with methyl, phenyl or chloro; 2,5-dichlorophenyl and 3,5-dimethoxyphenyl;

and the pharmaceutically-acceptable salts thereof, in an amount sufficient to lower said blood glucose level in said hyperglycemic mammal.

4,351,844

HYPOCHOLESTEROLEMIC HYDROGENATION PRODUCTS AND PROCESS OF PREPARATION

Arthur A. Patchett, Westfield, and Chan-Hwa Kuo, South Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

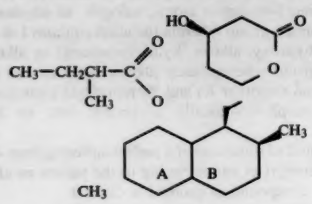
Continuation-in-part of Ser. No. 118,050, Feb. 4, 1980, abandoned. This application Dec. 1, 1980, Ser. No. 210,826

Int. Cl.[3] A61K *31/335, 31/215*; C07C *69/74, 59/11*

U.S. Cl. 424—279 10 Claims

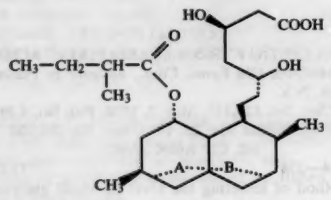
1. A compound of the formula:

II



and its free acid form

III



in which the dotted lines indicated as A and B represent optional double bonds, not more than one of A and B being a double bond, and, where neither A nor B is a double bond, the perhydronaphthyl ring is in the 4aα, 8aβ configuration, together with the pharmaceutically acceptable salts of said free acid and the lower alkyl and substituted lower alkyl esters of said free acid in which said substituent is phenyl, dimethylamino or acetylamino.

9. A method of treating hypercholesterolemia which comprises the administration to a patient in need of such treatment of an effective antihypercholesterolemic amount of a compound of formula II or III of claim 1.

10. An antihypercholesterolemic pharmaceutical composition comprising a pharmaceutical carrier and an antihypocholesterolemic effective amount of a compound of formula II or III of claim 1.

4,351,845

METHOD OF INCREASING FEED EFFICIENCY IN SWINE

Jesse E. Shively, Terre Haute, Ind., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 12, 1981, Ser. No. 243,105
Int. Cl.[3] A61K *31/35*
U.S. Cl. 424—283 **4 Claims**

1. A method of increasing the rate of growth and the utilization of feed in swine comprising orally administering to a pig weighing at least about 35 kg during the grower and finishes phases of the growth cycle an effective amount of lasalocid or a physiologically acceptable ester or salt thereof.

4,351,846

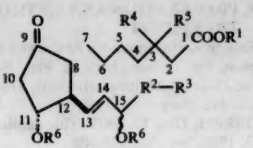
3-HYDROXY AND 3-OXO-PROSTAGLANDIN ANALOGUES

Kimiichiro Matsumoto; Hajimu Miyake, and Hisashi Suga, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 8, 1981, Ser. No. 262,209
Claims priority, application Japan, May 12, 1980, 55-061728
Int. Cl.[3] C07C *177/00*; A61K *31/557*
U.S. Cl. 424—305 **22 Claims**

1. A prostaglandin analogue of the formula:

IV



(wherein R^1 represents a hydrogen atom or an alkyl group containing from 1 to 12 carbon atoms, R^2 represents a single bond or an alkylene group containing from 1 to 5 carbon atoms, R^3 represents a hydrogen atom, an alkyl or alkoxy group containing from 1 to 8 carbon atoms, a cycloalkyl or cycloalkyloxy group containing from 4 to 7 carbon atoms and being unsubstituted or substituted by at least one alkyl group containing from 1 to 8 carbon atoms, or a phenyl or phenoxy group unsubstituted or substituted by at least one halogen atom, trifluoromethyl group or alkyl group containing from 1 to 4 carbon atoms, one of R^4 and R^5 represents a hydrogen atom and the other represents a hydroxy group or R^4 and R^5 together represent an oxo group, R^6 represents a hydrogen atom or a hydroxy-protecting group which may be removed under mild acidic conditions, the double bond between the carbon atoms in positions 13 and 14 is in trans configuration, the wavy line attached to the carbon atom in position 15 represents α- or β-configuration or a mixture thereof and, when one of R^4 and R^5 represents a hydrogen atom and the other represent a hydroxy group, the configuration of the carbon atom in position 3 is R or S or a mixture thereof, provided that, when R^2 represents a single bond, R^3 does not represent an alkoxy group, a cycloalkyloxy group or a phenoxy group) or when R^6 represents a hydrogen atom, a cyclodextrin clathrate thereof or, when R^1 and R^6 represent hydrogen atoms, a non-toxic salt thereof.

4,351,847

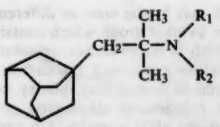
ANTIVIRAL ALPHA, ALPHA-DIALKYL ADAMANTYLETHYLAMINES

Ronald C. Griffith, Pittsford, and Clyde R. Kinsolving, Fairport, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 26, 1981, Ser. No. 277,777
Int. Cl.[3] A61K *31/13*
U.S. Cl. 424—325 **6 Claims**

1. A method for treating herpes II virus in a warm-blooded animal comprising administering to the animal in need of said treatment an effective amount for treating the herpes II virus of a composition comprising (i) a compound of the formula I or its acid salt:

(I)



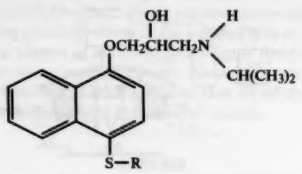
wherein R_1 and R_2 are selected from the class consisting of H and $-CH_3$ and (ii) at least one pharmaceutically acceptable carrier, wherein the compound is 0.01 to 95% by weight of the composition.

4,351,848
1-((1-METHYLETHYL)AMINO)-3-(((4-ALKYLTHIO)1-NAPHTHALENYL)OXY)-2-PROPANOL

Thomas Walle, Charleston, S.C., assignor to Drug Science Foundation, Charleston, S.C.

Filed Mar. 16, 1978, Ser. No. 887,371
Int. Cl.[3] A01N *33/02*; C07C *93/06*
U.S. Cl. 424—330 6 Claims

1. A compound of the formula:

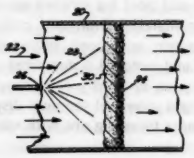


wherein R represents a lower alkyl having from 1 to about 3 carbon atoms; and the pharmaceutically-acceptable salts thereof.

4,351,849
FORAMINOUS MAT PRODUCTS

Reginald E. Meade, Stillwater, Minn., assignor to DEC International, Madison, Wis.

Continuation of Ser. No. 55,626, Jul. 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 850,294, Jul. 1, 1969, abandoned, which is a division of Ser. No. 553,101, May 26, 1966, Pat. No. 3,520,066. This application Jan. 29, 1976, Ser. No. 653,549
Int. Cl.[3] A23C *1/05*
U.S. Cl. 426—61 33 Claims



1. A highly porous mat of agglomerated particles collected on a foraminous member by spraying a mixture of liquid and solid materials into a stream of a drying gas which is flowed through the foraminous collecting member comprising:

a multiplicity of microscopic spheroidal particles which are initially deposited on the foraminous collecting member and are rigidly bonded together at their points of contact to form an initial bed extending substantially over the entire surface of the foraminous collecting member, having upper and lower surfaces, and a multiplicity of communicating pores and channels extending between said upper and lower surfaces and through which substantially all of said drying gas continues to flow,

said initial bed acting as a filter medium to subsequently remove air entrained particles from said drying gas which removed particles are rigidly bonded at their points of contact with each other and the particles forming said initial bed to provide a porous mat having a thickness of several inches corresponding to the combined thickness of a multiplicity of said particles, and

said resultant mat characterized by said bonded particles having a moisture content substantially less than at the time they are deposited on the foraminous collecting member or filtered from said drying gas and by having a void fraction value greater than 0.50.

4,351,850
PROCESS OF PRODUCING A BATTER-COATED ONION PRODUCT

Robert M. Costamagna; Denis W. Mori, and Allen R. Bardett, all of Gilroy, Calif., assignors to McCormick & Company, Incorporated, Hunt Valley, Md.

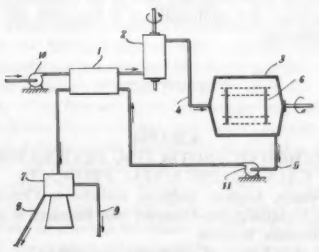
Filed Oct. 10, 1979, Ser. No. 83,314
Int. Cl.[3] A23L *1/214*
U.S. Cl. 426—302 3 Claims

1. A process for producing an onion food product comprising: slicing onion bulbs transversely to form slabs exhibiting concentric rings of onion scales; cutting each slab into pieces having a thickness dimension equal to the thickness of the slab, a width dimension and a length dimension greater than the width dimension by cutting along planes which are perpendicular to the plane of the slab and which are perpendicular to each other, the width and length dimensions being such that most of the pieces include a plurality of curved lengths of onion scales in side-by-side relationship; separating the onion pieces into their individual scales thereby forming nuggets; feeding the onion nuggets onto the upper surface of a generally horizontal elongated surface provided with longitudinal grooves, the surface being constructed of low-friction non-stick material and the surface being vibrated horizontally in the directions of the grooves to convey the nuggets longitudinally of the grooves and simultaneously to cause the nuggets to spread out laterally and longitudinally of the grooves so as to form discrete unagglomerated nuggets; discharging the discrete, unagglomerated nuggets to a batter-coating operation whereby the entire surface of each nugget becomes coated with batter.

4,351,851
METHOD FOR FREEZE-STABILIZING WINE

Hans M. Riese, Lund, Sweden, assignor to Alfa-Laval Inc., Poughkeepsie, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,138
Int. Cl.[3] C12H *1/00*
U.S. Cl. 426—524 6 Claims



1. A method for freeze-stabilizing wine, which comprises chilling the wine to a first temperature at which ice crystals are formed in the wine but while the wine is still pumpable, continuously conveying the chilled wine to a residence tank and there forming tartrate crystals in the wine, agitating the wine in said tank in order to maintain a homogeneous suspension of ice crystals and tartrate crystals in the wine, continuously passing the wine and the suspension of ice and tartrate crystals from said tank through a heating zone, heating and the suspension in said zone to a second temperature at which the ice crystals melt while retaining the tartrate crystals, and removing said tartrate crystals from the wine.

4,351,852

LOW CALORIE CAKE BATTER OR MIX

Charles E. Rule, Lakewood; Cecilia Gilmore, Strongsville, and Eugene J. Stefanski, Garfield Heights, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,609
Int. Cl.³ A21D 10/00
U.S. Cl. 426—554 9 Claims

1. A substantially fat-free, defined as added fat, chemically leavened cake batter or mix, of the type which normally contains a substantial amount of shortening, as distinguished from a sponge cake, comprising cake making essential ingredients, consisting essentially of flour, sugar and eggs, intimately blended with mono- and diglyceride emulsifier, in effective amounts to obtain good volume, grain and texture, the diglyceride being present in the weight proportions of about 38–48%, based on emulsifier weight and a triglyceride content less than the mono- and diglyceride contents combined, the ratio of diglyceride to monoglyceride being about 5:1 to about 1.5:1.

4,351,853

METHOD FOR PRODUCING PROSTHETIC DENTAL APPLIANCES BY PHOTOPOLYMERIZING A SHAPEABLE MASS

Peter Jochum, Hechendorf, and Oswald Gasser, Seefeld, both of Fed. Rep. of Germany, assignors to Espe Fabrik Parmazeutischer Präparate G.m.b.H., Seefeld, Fed. Rep. of Germany

PCT No. PCT/DE81/00014, § 371 Date Sep. 11, 1981, § 102(e) Date Sep. 11, 1981, PCT Pub. No. WO81/01959, PCT Pub. Date Jul. 23, 1981
PCT Filed Jan. 15, 1981, Ser. No. 302,412
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001616
Int. Cl.³ C08F 2/46
U.S. Cl. 427—2 9 Claims

1. Method for production of prosthetic dental appliances by photopolymerizing of a deformable mass, comprising ethylenically unsaturated polymerizable monomer compounds and as photoinitiators, 1,2-diketones, as well as possibly fillers, dyes and inhibitors, characterized in that the mass containing a bicyclo-[2.2.1]-heptane-dione-2,3 compound as 1,2-diketone is polymerized by irradiation and then in the obtained prosthetic dental appliance the photoinitiator is bleached out through further irradiation.

4,351,854

METHOD OF PROTECTING DEVICES FOR GALVANIZING METAL PRODUCTS

Jacques Pelerin, Angleur, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Nov. 18, 1980, Ser. No. 208,032
Claims priority, application Belgium, Nov. 21, 1979, 880195
Int. Cl.³ C23C 1/02
U.S. Cl. 427—34 16 Claims

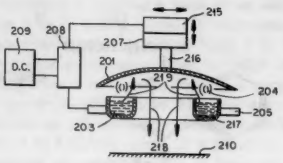
1. In a process for the galvanization of metal products, a method of protecting a device which comes into contact with zinc during galvanization, the method comprising depositing an intermediate layer of at least one metal selected from the group consisting of nickel and aluminum on the device and depositing on the intermediate layer a surface layer comprising at least one constituent selected from the group consisting of the oxides of Mg, Ca, Sr, Ba, Ti, Zr, Cr, W, Fe, Co, Ni, Zn, Cd, B, Al, Si, Ge, Sn, and Pb, the zirconates of Mg, Ca, Sr, and Ba, serpentine, the amphiboles, and silicon carbide.

4,351,855

NONCRUCIBLE METHOD OF AND APPARATUS FOR THE VAPOR DEPOSITION OF MATERIAL UPON A SUBSTRATE USING VOLTAIC ARC IN VACUUM

Eduard Pinkhasov, Forest Hills, N.Y.

Filed Feb. 24, 1981, Ser. No. 237,670
Int. Cl.³ C23C 13/00, 13/12
U.S. Cl. 427—37 7 Claims



1. A method of depositing a material upon a substrate, comprising the steps of:

forming a pool of material in a molten state;

striking an arc at least in part between said pool and at least one electrode spaced from said pool, thereby vaporizing material from said pool;

disposing a substrate in spaced relationship with said arc and in the path of vapor of material formed from said pool to deposit said material from a vapor state on said substrate; and

intermittently dipping said electrode into said pool to form a coating of said material on said electrode and vaporizing the coating of said material on said electrode with said arc to form said material in the vapor state.

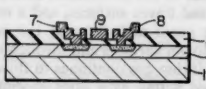
5. An apparatus for depositing material upon a substrate, comprising means for holding a pool of molten material to be deposited on said substrate, an electrode spacedly juxtaposed with said pool, a source of electric current connected between said electrode and said pool for striking an arc therebetween, thereby vaporizing material from said pool, and means for positioning a substrate in spaced relationship to said arc whereby vapor of said material is deposited on said substrate, said container being an upwardly open annular crucible and said electrode being a spherical segment disposed above said crucible and striking a traveling arc with said pool.

4,351,856

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Makoto Matsui, Kunitachi; Yasuhiro Shiraki, Hino; Yoshifumi Katayama, Tokorozawa; Toshihisa Tsukada, Sekimachi, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,185
Claims priority, application Japan, Jul. 20, 1979, 54-91566
Int. Cl.³ B05D 3/06, 5/12; B32B 17/06
U.S. Cl. 427—38 8 Claims



1. A method of manufacturing a semiconductor device comprising the steps of mounting an amorphous or polycrystalline substrate in a vacuum chamber, and evaporating a polycrystalline silicon film onto said substrate under conditions that the pressure during the evaporation is below 1×10^{-8} Torr and that a partial pressure of oxygen during the evaporation is below 1×10^{-9} Torr, and forming at least one semiconductor device employing said polycrystalline silicon film.

4,351,857

NEW SURFACE IN CELLULOSIC FIBERS BY USE OF RADIOFREQUENCY PLASMA OF AMMONIA

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 19, 1981, Ser. No. 294,095

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—40 **7 Claims**

1. A process for producing a polymeric-type film in the surface of cellulosic fibers which process comprises:

irradiating cellulosic fibers in the colored area of a radiofrequency plasma of ammonia in a reactor designed so that the ammonia is admitted into the reactor area between electrodes and at such a rate so that all of the ammonia molecules have been activated to plasma.

4,351,858

PROCESS FOR THE MANUFACTURE OF SUBSTANTIALLY PORE-FREE SHAPED POLYCRYSTALLINE ARTICLES BY ISOSTATIC HOT-PRESSING

Klaus Hunold, Kempten; Klaus Reinmuth, Durach; Alfred Lipp, Bad Worishofen; Johannes Napholcz, Kempten, and Peter Arnold, Sulzberg, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk kempten GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,106

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009240

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—193 **12 Claims**

1. In a process for the manufacture of substantially pore-free shaped polycrystalline articles from heat-resistant articles having open pores in a vacuum-sealed casing of vitreous material by means of isostatic hot-pressing in a high pressure autoclave using an inert gas as pressure-transfer medium, the improvement which comprises applying a first layer comprising a material selected from the group consisting of organic materials that can be decomposed or melted at temperatures of up to about 400° C. under normal pressure, heat-resistant materials that are compressible to at least half their volume, or combinations thereof to the heat-resistant articles; applying a second layer comprising a vitreous or ceramic-like material over said first layer to form an encased article; thermally treating the encased article until the second layer is fused or sintered to form the vacuum sealed casing; and isostatically hot-pressing the vacuum sealed encased article until a substantially pore-free shaped polycrystalline article is formed.

4,351,859

PROCESS FOR ENAMELING THE INSIDE SURFACE OF HOLLOW VESSELS

Ferdinand Hartmann, Vienna, Austria, assignor to Austria Email Aktiengesellschaft, Vienna, Austria

Filed Apr. 1, 1980, Ser. No. 136,250

Claims priority, application Austria, Apr. 2, 1979, 2422/79; Apr. 12, 1979, 2754/79; Jun. 18, 1979, 4280/79

Int. Cl.³ B05D *7/22*

U.S. Cl. 427—232 **5 Claims**

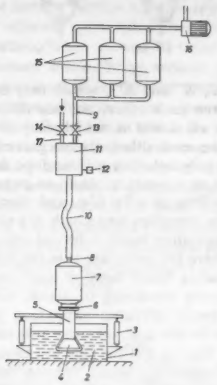
1. A process of enameling the inside surface of hollow vessels comprising:

connecting to one end of the vessel means for establishing a negative pressure within the vessel;

connecting to the other end of the vessel means for charging the interior of the vessel with slip;

establishing fluid communication between said means for establishing and the interior of the vessel, while blocking fluid communication between said means for charging and the interior of the vessel so that a negative pressure is established within the vessel thereby evacuating substantially all of the air from the vessel whereby air is removed from surface pores and cracks of the vessel;

establishing fluid communication between said means for establishing and the interior of the vessel after air has been



removed from the vessel so that slip flows suddenly into the hollow vessel and completely fills the same, the slip being degasified during introduction into the vessel and filling the surface pores and cracks of the vessel; and

removing excess slip from the hollow vessel.

4,351,860

POLYARYL ETHER SULFONE SEMIPERMEABLE MEMBRANE AND PROCESS FOR PRODUCING SAME

Koichi Yoshida, Fuji; Fusakazu Hayano, Chigasaki, and Yoshiro Ii, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,010

Claims priority, application Japan, May 2, 1978, 53-52919

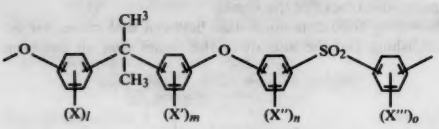
Int. Cl.³ B05D *5/00;* **B01D** *39/6;* **B32B** *3/26, 27/06*

U.S. Cl. 427—246 **8 Claims**

1. A process for producing a polyaryl ether sulfone semipermeable membrane having pores of a diameter increasing progressively and continuously from first and second major opposite surface layers of the membrane to the center portion thereof, which center portion is located approximately equidistant from the first and second major opposite surface layers, and the membrane is comprised of a single continuous polymer phase; the diameter of pores present on or in the immediate proximity of the first and second major opposite surface layers being such that the percentage rejection of dextran molecules having an average molecular weight of 10,000 is not greater than 95%, the percentage rejection of dextran molecules having an average molecular weight of 70,000 is in the range of from 5% to 95% and the percentage rejection of dextran molecules having an average molecular weight of 500,000 is at least 5%, and; the average diameter of pores present in said center portion being in the range of from 0.05 to 10 microns;

which process comprises the steps of:

dissolving a polyaryl ether sulfone in a mixed solution comprised of (1) a mixed solvent of (a) an organic polar solvent capable of dissolving the polyaryl ether sulfone and (b) 5 to 50% by weight, based on the weight of the organic polar solvent, of a liquid miscible with the organic polar solvent but incapable of dissolving the polyaryl ether sulfone and (2) 0.5 to 10% by volume, based on the volume of the mixed solvent of an aqueous electrolyte solution, thereby forming a dope of the polyaryl ether sulfone; said polyaryl ether sulfone being comprised of recurring units represented by the general formula (I):



(I)

wherein X, X', X'' and X''', which may be identical to or different from each other, are non-dissociative substituents, and l, m, n and o, which may be identical to or different from each other, are integers of from 0 to 4;

extruding the polyaryl ether sulfone dope through a circular or linear slit or a nozzle to obtain an extrudate in the form of a hollow fiber or a flat film, and; then,

introducing the extrudate into a bath of a coagulating liquid, while a coagulating liquid is forced into the extrudate in the case where the extrudate is in the hollow fiber form, said coagulating liquid being at least one liquid selected from the group consisting of water, methanol, ethanol, ethylene glycol, glycerol, propylene glycol, ethylene diamine and formic acid, whereby both sides of the wall of the hollow fiber or the flat film are brought into contact with the coagulating liquid, thereby removing substantially all the mixed solvent from the hollow fiber or flat film to obtain the membrane.

4,351,861

DEPOSITION OF COATINGS FROM VAPORIZED REACTANTS

Vern A. Henery, Plum Borough, Pa., assignor to PPG Industries Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 74,581, Sep. 12, 1979, which is a division of Ser. No. 836,177, Sep. 23, 1977, Pat. No. 4,182,783.
This application May 18, 1981, Ser. No. 264,520
Int. Cl.[3] C23C *11/00, 13/12*
U.S. Cl. 427—255.1 **7 Claims**

1. In a method for coating a substrate with a film by deposition from a vaporous reactant composition comprising the steps of:

fluidizing a mass of particulate solid reactant with a gas at a first temperature substantially below the reaction, vaporization or decomposition temperature of the reactant;

drawing a volume of fluidizing gas and suspended particulate solid reactant from the fluidized mass as a particulate reactant-gas composition;

mixing the withdrawn volume of fluidizing gas and suspended particulate reactant with an additional volume of gas which is at a second temperature, also below the decomposition temperature for the reactant to dilute the particulate reactant-gas composition;

heating the diluted particulate reactant-gas composition to a temperature above the vaporization temperature of the reactant; and

conveying the heated reactant-gas composition into contact with the substrate to be coated;

the improvement which comprises maintaining the substrate at a temperature below said reaction temperature but sufficient to cause the reactant in the composition to deposit a film thereon.

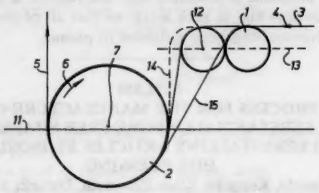
4,351,862

CONTINUOUS HOT-DIP COATING OF METAL STRIP

Paul Cosse, Bellaire, and Jacques Pelerin, Angleur, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research In De Metallurgie, Brussels, Belgium

Filed Dec. 2, 1980, Ser. No. 212,261
Claims priority, application Luxembourg, Dec. 5, 1979, 81955
Int. Cl.[3] C23C *1/02*
U.S. Cl. 427—300 **11 Claims**

1. In a method of continuous hot-dip coating of a two sided metal strip in molten metal wherein an outer side is afforded a full-coating and an inner side is afforded a coating infinitely variable from no-coating up to a full-coating; wherein the metal strip is brought into substantially non-slipping contact on its inner side with a masking roll cylinder rotating about a substantially horizontal axis and which is at least partially immersed in a bath of the molten metal, by introducing the strip into the bath of molten metal, passing the strip around the masking roll so that the inner side of the strip is in contact with a portion of the outer cylindrical surface of the masking roll and then terminating the contact and removing the strip from the molten metal, the outer side of the strip being in contact with the molten metal during the entire passage around the masking roll; and wherein the metal strip is guided by an auxiliary guide roll prior to entry into the molten metal bath, said auxilliary guide roll having an axis parallel to and above the axis of the masking roll; the improvements comprising:



affording a masking roll cylinder whose outer surface consists essentially of a material which is non-wettable by the molten metal; and

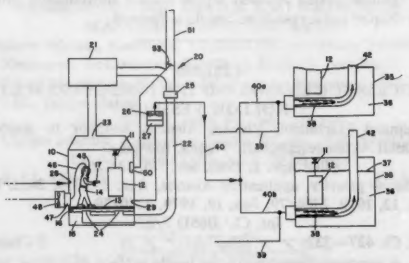
modifying the positions of the point at which the inner side first contacts the surface of the masking roll and the point at which the inner side terminates its contact with the masking roll, thereby permitting varying the exposure of the inner side to the molten metal from substantially no exposure resulting in substantially no-coating up to substantially full exposure resulting in a full-coating.

4,351,863

PAINT SPRAYING ASSEMBLY

Keith G. Roesner, Kewanee, Ill., assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 65,446, Aug. 10, 1979, Pat. No. 4,266,504.
This application Nov. 4, 1980, Ser. No. 203,861
Int. Cl.[3] B05D *1/02*
U.S. Cl. 427—421 **10 Claims**



1. A method of maintaining safe painting conditions in a paint spraying booth for a human spraying articles therein and for reducing the contaminants moving through an exhaust therefrom, comprising the steps of: recirculating air through the booth at a relatively high volumetric rate as articles are being sprayed by a human; removing substantially all the paint particles from the air leaving the booth as it is recirculated; drawing off a quantity of the recirculating air at a comparatively low volumetric rate and replacing it with clean air sufficient to maintain the recirculating air at a safe LEL, but at a

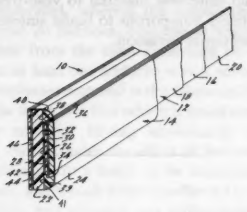
solvent contaminant level unsatisfactory for breathing; burning the solvent from the drawn air prior to its moving through the exhaust; and placing a pressurized hood supplying clean air to the external respiratory orifices of the human in the booth so as to protect the human from paint contaminate in the recirculated air.

4,351,864

MOLDING HAVING ENCAPSULATED METALLIZED FILM

Dimitrios Giannakidis, Athens, Greece, assignor to The Standard Products Company, Cleveland, Ohio

Filed May 6, 1981, Ser. No. 261,041
Int. Cl.³ B60R *13/00*; B32B *15/08*
U.S. Cl. 428—31 **10 Claims**



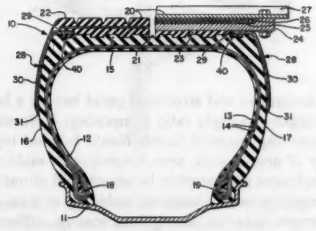
1. An automotive molding having:
a body comprising an ionomer resin;
a cover layer comprising an ionomer resin; and
a film coated on both sides with metal and sandwiched between and bonded to said body and said cover layer.

4,351,865

TIRE SIDEWALL PROTECTOR

George T. Watts, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 15,492, Feb. 26, 1979, Pat. No. 4,310,041. This application Aug. 28, 1981, Ser. No. 297,396
Int. Cl.³ B60C *27/20*; B32B *1/08*; F16L *57/00*
U.S. Cl. 428—36 **8 Claims**



1. An annular resilient shield for protection of a sidewall of a tire of the type having a tire carcass, a removable traction element overlying the carcass, and a pair of sidewalls which at least partially surround the carcass, the shield being formed of reinforced elastomeric material and being of generally L-shaped radial cross-sectional configuration, the shield including

a cylindrical portion adapted to be secured between the traction element and the tire carcass, the cylindrical portion being of a manufactured inside diameter less than the outside diameter of the inflated tire carcass over which it is to be fitted;

means carried by the cylindrical portion for forming a mechanical interlock with at least one of the two tire components between which it is adapted to be secured;

an annular sidewall-covering portion extending generally radially inwardly from one axial end of the cylindrical portion, the annular portion adapted to at least cover and engage the adjacent upper sidewall portion of the tire, the annular portion, when viewed in radial cross-section of the undeformed shield, being arcuate and of a smaller radius of curvature than the tire carcass and adjacent sidewall portion when these are viewed in radial cross-section of the inflated tire to which the shield is adapted;

the annular portion including at least two layers of elastomer-coated cord fabric, the cords of adjacent layers of which extend at oppositely directed angles relative to the circumferential direction of the shield, the angle of each of the cords of the undeformed shield near the junction of the annular portion and the cylindrical portion being from about 30 to about 65 degrees relative to the circumferential direction of the shield.

4,351,866

FLEXIBLE STRIP FACING MATERIAL AND METHOD AND APPARATUS FOR CUTTING THE MATERIAL

Paul Mennesson, 32, Avenue du Bois, 78620 L'Etang-la-Ville, and Hugues Moreau, 103, Avenue Felix Faure, 75015 Paris, both of France

Filed Jun. 26, 1980, Ser. No. 163,627
Claims priority, application France, Jul. 5, 1979, 79 17447
Int. Cl.³ B31F *5/00*; B32B *3/10, 5/16*
U.S. Cl. 428—60 **5 Claims**

1. A strip facing material having a visible face and an opposed nonvisible face and adapted to be applied to the walls of buildings, comprising a flexible and extensible perforated support, and a covering of particles of hard material bound together and secured to one of the faces of the flexible support by a flexible transparent macromolecular binder with a low water retention, characterised in that one of the two longitudinal edges of the strip facing material is cut in a first bevel in such a manner that, along this edge, the visible face of the facing material overhangs in relation to the nonvisible face, and in that its other longitudinal edge is cut in a second bevel in such a manner that, along this other edge, the visible face of the facing material is set back in relation to the nonvisible face, the angle of the second bevel measured from a line perpendicular to said faces being less than that of the first bevel.

4,351,867

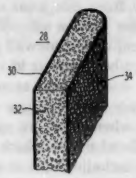
THERMAL INSULATION COMPOSITE OF CELLULAR CEMENTITIOUS MATERIAL

Robert F. Mulvey, Malvern, and Charles E. Crepeau, Centre Square, both of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Mar. 26, 1981, Ser. No. 247,669
Int. Cl.³ B32B *3/00, 3/26*
U.S. Cl. 428—70 **14 Claims**

1. A thermally insulating composite comprising:
(a) a low-density cellular cementitious material containing fibrous material; and
(b) at least one structural surface element of cellular cementitious material formed from, integrally with, and upon at least part of the low-density material, the structural sur-

face element containing fibrous material and having a higher density than the low-density material.



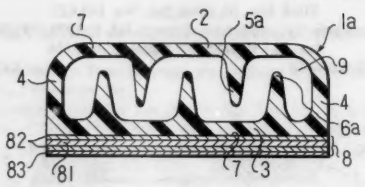
12. The thermally insulating composite of claim 1 further comprising a permeable enclosure element upon the higher density structural surface.

4,351,868

MOLDING

Takashi Otani, Nagoya, Japan, assignor to Toyoda Gosei Co., Ltd., Aichi, Japan

Filed Apr. 15, 1981, Ser. No. 254,267
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—120 **5 Claims**



1. Molding made of high polymer material, formed as a hollow molding body from extrusion for installation on a substance by adhesive means on a rear surface of said molding body, characterized in that plural pieces of a projecting pillar are arranged to be projecting from an upper wall and a bottom wall of a hollow portion of said molding body in the longitudinal direction, each of said pillars being of insufficient length to communicate with said opposed wall and pillar to define a continuous transverse hollow portion when said molding is free from a pushing force applied to said molding, and each of said pillars being sufficiently long to make contact with opposed wall and pillar when a pushing force is applied to said molding to substantially evenly apply said force to said adhesive.

4,351,869

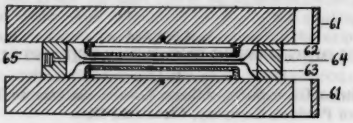
SINTERED POLYMER MOLDINGS AND COMPOSITES HAVING ALTERED CROSS SECTION(S): FLUID COMPACTING AND SINTERING PROCESS AND APPARATUS FOR MAKING SAME

Charles N. Cresap, Silver Mountain, Millerton, N.Y. 12546

Continuation-in-part of Ser. No. 901,625, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 585,347, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 173,601, Aug. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 676,674, Oct. 16, 1967, abandoned. This application Jun. 17, 1980, Ser. No. 160,184
Int. Cl.³ B32B *3/04, 27/00;* B29C *17/06;* B29D *9/04*
U.S. Cl. 428—121 **20 Claims**

1. A molded sintered polymer high density article comprising a body having a first portion and at least one second portion with altered configuration, each said first and second portions being uniformly void-free, said first portion having a different density than said second portion and each portion having a density above the threshold for liquid porosity.

11. A process for molding a sintered polymer article having at least one cross-sectional variation from subdivided sinterable polymer material comprising the steps of agglomerating a



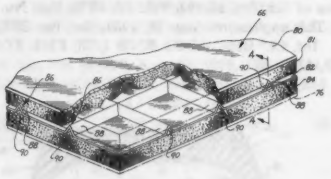
supply of sinterable polymer in the porous state, heating said sinterable material to sintering temperature while simultaneously applying fluid under pressure to compact and irreversibly density said sinterable material to void-free condition to produce an entirely non-porous to liquid sintered article with desired cross-sectional variation.

4,351,870

MAXIMIZED STRENGTH-TO-WEIGHT RATIO PANEL MATERIAL

Edgar English, Jr., 45125 Redwood Ave., Lancaster, Calif. 93534

Filed Oct. 22, 1979, Ser. No. 86,748
Int. Cl.³ B32B *3/02, 7/04;* E04B *2/00*
U.S. Cl. 428—174 **19 Claims**



1. A decorative and structural panel having a large magnitude strength-to-weight ratio comprising: a plurality of laminated panelling material layers firmly bonded together at a plurality of area-spaced, area-disseminated, multi-point interface attachment and junction locations, said plurality of layers of laminated panelling material including at least one convoluted, weight-reducing, strength-increasing, stiffening layer of structural, formed material having a plurality of convolutions extending transversely from a surface plane thereof, said convolutions having outer contact surface portions in contact with corresponding surface portions of a next adjacent layer, at least said convoluted layer being made of a formable thin sheet of high strength material, said laminated panel further including at least one low-density, high specific volume, expanded, compressible, foam filler material layer containing and surrounding a plurality of hollow cells, said foam filler material having a maximized volume-to-weight ratio and carrying a fire extinguishing agent comprising a halogenated compound in particulate form, said halogenated compound being decomposible when subjected to the heat of combustion and adapted to produce, as a result of decomposition, a fire extinguishing gas.

4,351,871

DECORATING TEXTILE FABRICS

Edward J. Lewis, Underwood, Badger La., Hipperholme, Near Halifax, and Ian D. Rattee, 1 St. Catherine's Walk, Leeds LS8 1SB, both of England

Continuation of Ser. No. 966,071, Dec. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 547,484, Feb. 6, 1975, abandoned, Ser. No. 729,037, Oct. 4, 1976, abandoned, Ser. No. 778,157, Mar. 16, 1977, abandoned, and Ser. No. 851,717, Nov. 15, 1977, abandoned. This application Feb. 23, 1981, Ser. No. 236,722

Claims priority, application United Kingdom, Feb. 15, 1974, 7100/74; Mar. 4, 1974, 9653/74; Jun. 21, 1974, 27778/74; Jun. 30, 1974, 33618/74; Oct. 9, 1974, 41473/75

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—195 35 Claims

11. A fabric decoration material comprising a flexible substrate and at least one layer transferable from the substrate to a fabric to be decorated, wherein the transferable layer has a thickness at most 20 microns, contains at least one colorant material selected from the class consisting of dyes and pigments, contains at least one additive which serves to assist the fixation of the colorant material in the fabric under the effect of heat and is in the form of a film which is based on a thermoplastic polymeric material having elastomeric characteristics which may be caused under the effect of heat and pressure to adhere more strongly to a fabric to be decorated than to the flexible substrate, and which when transferred to a fabric under the action of heat and pressure and subsequently heated to a temperature below that at which the fabric may be damaged undergoes physical breakdown from its film form into discrete particles in a discontinuous distribution whereby to form a discontinuous decoration on the fabric surface.

4,351,872

UNIDIRECTIONAL STRETCH MESH LAMINATE AND METHOD

Janet V. Brosseau, and Jon A. Brosseau, both of Los Altos, Calif., assignors to Harvey G. Lowhurst, Atherton, Calif.

Division of Ser. No. 827,229, Aug. 24, 1977, Pat. No. 4,146,021. This application Jan. 8, 1979, Ser. No. 2,066

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 4 Claims

1. A substantially flat sheet of material comprising:

a first layer of two-way stretch material; and

at least one pad of unidirectional stretch mesh bonded to said first layer at a selected location thereof and having selected angular orientation to restrict said selected location to a one-way stretch in a direction determined by said selected orientation.

4,351,873

DOUBLE FACED INSULATING BOARD

Duane A. Davis, Plainfield, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,045

Int. Cl.³ B32B *3/26, 5/18, 7/14*

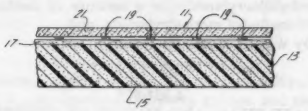
U.S. Cl. 428—198 10 Claims

1. Thermal insulating board comprising:

(a) a rigid closed cell foam core, the cells of which contain fluorocarbon gas;

(b) a first continuous facing continuously adhered to a face of said core, said first facing being non-porous; and

(c) a second continuous facing intermittently adhered to and spaced from said first facing by areas of water resistant



adhesive, said second facing being non-absorbent and said areas of adhesive being spaced so as to allow unrestricted lateral venting of gases from between the facings to the edges of the board.

4,351,874

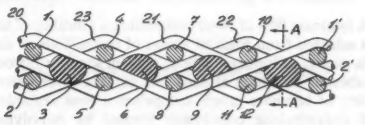
LOW PERMEABILITY DRYER FABRIC

Garry E. Kirby, Marietta, Ga., assignor to JWI, Ltd., Montreal, Canada

Filed Mar. 24, 1980, Ser. No. 133,433

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—229 15 Claims



1. A dryer fabric comprising a plurality of interwoven monofilament plastic polymeric warp and weft strands, at least some of said weft strands are stuffer strands formed of a material softened under the influence of controlled heat during a heat-setting treatment, said stuffer strands being selected from a deformable material which is more absorbtive of said controlled heat than are the remainder of said strands, so that said deformable material softens preferentially whereby said material becomes narrower at crossings of adjacent warp strands and correspondingly bulges between alternate warp strands to reduce the spaces in the interstitial areas formed by surrounding strands thereby lowering the permeability of said fabric, said deformable material retaining its solid property during deformation thereof.

4,351,875

HETEROPOLYMER ACRYLIC LATICES AND TEXTILES TREATED THEREWITH

Charles T. Arkens, Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 149,090, May 12, 1980, abandoned, which is a division of Ser. No. 945,733, Sep. 25, 1978, Pat. No. 4,277,384. This application Oct. 21, 1981, Ser. No. 313,399

Int. Cl.³ B32B *27/04*

U.S. Cl. 428—290 4 Claims

1. An article of manufacture comprising a sheet of release material having a dried film of the composition of an acrylic latex, the particles of which comprise about 30–60% by weight of a polymeric core and about 70–40% by weight of a polymeric shell; wherein said core is formed by emulsion copolymerization of a first monomer composition consisting essentially of:

70–95% by weight of a C_1–C_8 alkyl acrylate;

0–15% by weight of a C_1–C_8 alkyl methacrylate,

4–10% by weight of acrylamide or methacrylamide,

0–0.3% by weight of allyl methacrylate, and

0–2% by weight of itaconic acid;

and wherein said shell is formed on said core by emulsion

polymerization of a second monomer composition in the presence of said core, said second monomer composition comprising essentially of:

40–70% by weight of a C_1–C_8 alkyl acrylate,

20–50% by weight of a C_1–C_8 alkyl methacrylate,

2–10% by weight of N-methylol acrylamide,

N-methylol methacrylamide, or a mixture of acrylamide and N-methylolacrylamide, or a mixture of methacrylamide and N-methylol methacrylamide, and

0–2% by weight of itaconic acid.

4,351,876

LAMINATE FILMS AND SHEETS OF CROSSLINKED POLYETHYLENE RESINS

Shuhei Doi; Tsutomu Isaka, both of Yokkaichi, and Shinichiro Iida, Mie, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Dec. 17, 1980, Ser. No. 217,460

Claims priority, application Japan, Dec. 27, 1979, 54/173641

Int. Cl.³ B32B *27/06, 27/28, 15/08, 27/08*

U.S. Cl. 428—349 **8 Claims**

1. A laminate film or sheet comprising a plurality of laminate layers selected from films or sheets of resins, foils or sheets of metals, paper, cellophane, fabric, glass in sheet or fibrous form and asbestos, in which at least one surface layer among said plurality of laminate layers comprises a heat sealable crosslinked polyethylene copolymer formed by copolymerizing ethylene monomer and an ethylenically unsaturated silane compound so that said copolymer contains about 0.001 to 5 percent by weight of said silane compound and then crosslinking the resultant copolymer by contact with moisture in the presence of a silanol condensation catalyst, whereby the crosslinked copolymer has a gel content of 5 percent or more.

4,351,877

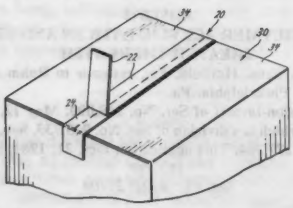
MULTIPLE LAYERED LAMINATED STRIPPABLE TAPE

Robert E. Williams, 9104 Rott Rd., St. Louis, Mo. 63127

Filed Oct. 6, 1980, Ser. No. 194,568

Int. Cl.³ C09J *7/02;* **B32B** *23/08, 27/10*

U.S. Cl. 428—350 **5 Claims**



1. A thin strippable tape for such use as sealing carton tops together, comprising a thin film of strong plastic material to provide a strength layer, a weak, thin carrier layer united on one side to the strength layer, and a water-soluble adhesive film on the opposite side of the carrier layer; the strength layer of plastic material being non-rigid, flexible and floppy, and hence unable to be dispensed lengthwise from a tape dispenser, and the plastic being unable to hold a coating of water-soluble adhesive, the carrier layer being of thin paper-like material continuous and unbroken laterally across the strength layer, the carrier material being capable of holding a water-soluble adhesive, and also of being united to the plastic film, the plastic film and the carrier layer when thus united having sufficient stiffness to enable the resulting tape to be fed lengthwise from a tape dispenser; and the adhesive film being on the exposed face of the carrier opposite the plastic film, the strength layer being of plastic material strong enough to be stripped from an object such as carton flaps to which the tape has been applied, and the carrier layer being of material so weak that when the tape is stripped from the object upon which it is adhered, any parts of the carrier remaining on the object are readily breakable to permit the carton flaps to be easily separated.

4,351,878

COATING FOR GASIFIABLE CARBON-GRAPHITE FIBERS

Jan Harper-Tervet, Palmdale; Warren L. Dowler, Sierra Madre; Shiao-Ping S. Yen, Altadena, and William A. Mueller, Glendale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Jun. 30, 1980, Ser. No. 164,585

Int. Cl.³ B32B *19/02*

U.S. Cl. 428—367 **13 Claims**

1. A composition of matter comprising:

graphite fibers having a diameter from 1 to 30 microns directly coated with 0.1 to 10% by weight of a thin, uniform, firmly adherent, film of a linear organic polymer containing anion groups selected from sulfonic, carboxyl or phosphonic which are cross-linked by cations of a polyvalent metal having a work function below 4.2 eV to form macrosalt cross-links with said groups on adjacent polymer chains; said metal being present in an amount of 0.05 to 20% by weight; and

said coated fibers being dispersed and embedded in a binder resin in an amount of 30 to 70% by weight.

4,351,879

POROUS ACRYLIC SYNTHETIC FIBERS COMPRISING CELLULOSE ACETATE IN AN ACRYLIC MATRIX

Yoshikazu Kondo; Toshihiro Yamamoto, and Takaji Yamamoto, all of Hofu, Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers Ltd., Osaka, both of, Japan

Filed Jun. 6, 1980, Ser. No. 156,993

Claims priority, application Japan, Jun. 18, 1979, 54-77046; Jun. 18, 1979, 54-77049; Oct. 1, 1979, 54-127065; Oct. 1, 1979, 54-127066

Int. Cl.³ B32B *27/02;* **D01F** *8/02, 8/10;* **D02G** *3/00*

U.S. Cl. 428—374 **31 Claims**

1. Porous acrylic synthetic fibers consisting of 2 to 30% by weight of cellulose acetate and 70 to 98% by weight of an acrylic polymer, the cellulose acetate being distributed in the acrylic polymer in an elongated form with the longest dimension thereof being parallel to the fiber axis, said synthetic fibers having substantially no microvoids, but having mainly macrovoids therein, and having a surface area A of voids of no greater than 15 m^2/g, a porosity V of 0.05 to 0.75 cm^3/g, and a V/A ratio of not less than 1/30.

4,351,880

PREVENTION OF ADHESION OF EPOXY RESINS

Shosin Fukui, Toyonaka, and Masayoshi Shinjo, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 126,173, Feb. 29, 1980, abandoned. This application Apr. 8, 1981, Ser. No. 252,146

Claims priority, application Japan, Mar. 1, 1979, 54-24359; Oct. 5, 1979, 54-129046

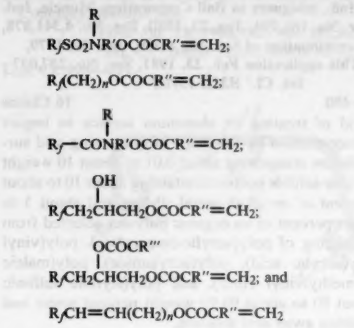
Int. Cl.³ D02G *3/00*

U.S. Cl. 428—378 **17 Claims**

1. A method for coating an electrical product having an electrically conductive lead wire comprising:

coating onto said electrically conductive lead wire an aqueous suspension or an organic solution consisting essen-

tially of a polymer of (a) at least one C_4 to C_{21} perfluoroalkyl group-containing polymerizable compound selected from the group consisting of:



wherein R_f is a C_4 to C_{21} perfluoroalkyl group, R is a hydrogen atom or a C_1 to C_{10} alkyl group, R' is a C_1 to C_{10} alkylene group, R'' is a hydrogen atom or a methyl group, R''' is a C_1 to C_{17} alkyl group and n is an integer of 1 to 10, with or without (b) at least one compound copolymerizable therewith, the content of the component (a) being not less than 40% by weight based on the weight of the polymer and (c) a solvent selected from the group consisting of an organic solvent and water to thereby form a polymer coating on said lead wires;

drying said polymer coating; and

applying an epoxy resin to said article whereby the adhesion of epoxy resin to said polymer coated lead wires is prevented and whereby no material influence is exerted upon the soldering properties of said electrically conductive lead wire.

9. An electrical product formed by the process of claim **1**.

4,351,881

RADIATION CURED ACRYLATE COATING METHOD AND COATED PRODUCT

Kazumasa Kamada; Isao Sasaki, and Kenji Kushi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

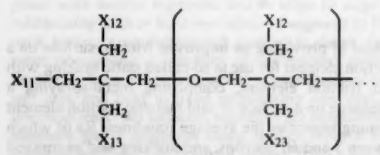
Division of Ser. No. 103,626, Dec. 14, 1979, Pat. No. 4,274,933.
This application Nov. 13, 1980, Ser. No. 206,560
Claims priority, application Japan, Dec. 28, 1978, 53-164683
Int. Cl.[3] **C08F** *2/50, 230/02, 228/04, 216/20*
U.S. Cl. 428—412 **6 Claims**

1. A process of providing a dyeable, cross-linked hardened film exhibiting substantial abrasion resistance, permanent antistaticity and a smooth surface, said process comprising:

(i) applying the coating composition comprising:

A. from about 5 to about 90 parts by weight of a monomer mixture which consists essentially of:

(1) from about 20 to about 95% by weight of a polypentaerythritol poly(meth) acrylate having at least three (meth)acrylololyloxy groups per molecule and represented by the formula:



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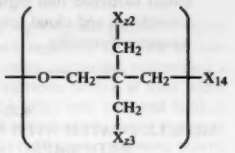
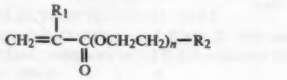


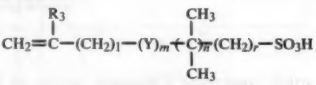
wherein at least 3 of X_{11}, X_{12}, X_{13}, X_{22}, X_{23}, X_{z2}, X_{z3}, and X_{14} are (meth)acryloyloxy groups, and the rest are OH groups and z is an integer of 1 to 5;

(2) from about 1 to about 25% by weight of a monomer represented by the formula:



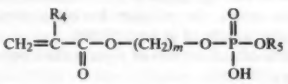
wherein R_1 is hydrogen or a methyl group, R_2 is an alkoxy or (meth)acryloyloxy group of 1 to 5 carbon atoms and n is an integer of 5 to 30;

(3) from about 1 to about 15% by weight of a sulfonic acid-type monomer represented by the formula:

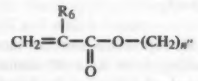


wherein R_3 is hydrogen or a methyl group, Y is a —CONH or —COO group and 1, m, n', and r are integers of 0 to 5;

(4) from about 1 to about 20% by weight of a phosphoric acid ester-type monomer represented by the formula:



wherein R_4 is hydrogen or a methyl group, R_5 is hydrogen, or a



group, wherein R_6 is hydrogen or a methyl group and m' and n'' are integers of 1 to 15; and

(5) from about 2 to about 20% by weight of an ethanolamine-type compound represented by the formula:

$$NR_7R_8(CH_2CH_2OH)$$

wherein each of R_7 and R_8 is independently hydrogen, an alkyl group of 1 to 15 carbon atoms or a CH_2CH_2OH group; together with

B. from about 95 to about 10 parts by weight of at least one organic solvent that forms a uniform solution when mixed with said monomer mixture A; and

C. 0.01 to 10 parts by weight of a photosensitizing agent per 100 parts by weight of the total of the monomer mixture A and organic solvent B; to the surface of a synthetic resin article, and

(ii) exposing and irradiating the thus-applied coating to cross-linking energy rays thereby cross-linking and curing

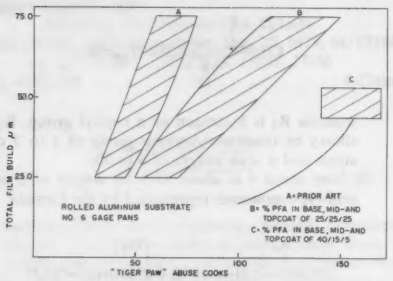
the coating and forming on said article a dyeable, cross-linked hardened film high in abrasion resistance, surface smoothness and cloud prevention, said film having a permanent antistaticity.

4,351,882

ARTICLE COATED WITH FLUOROPOLYMER FINISH WITH IMPROVED DURABILITY

Thomas P. Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1981, Ser. No. 224,684
Int. Cl.³ B32B *27/00, 27/06*
U.S. Cl. 428—422 **17 Claims**



1. An article comprising a substrate having on it multiple coatings, including a basecoat directly on the substrate, which basecoat is overlaid by at least one other coat, and wherein the basecoat is derived from a composition consisting essentially of, by weight:

(a) 15–65% of a particulate polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

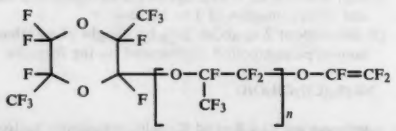
(b) 30–50% of at least one of a particulate copolymer containing

(i) 99.5–92% of tetrafluoroethylene,

(ii) 0.5–8% of at least one perfluorinated vinyl ether having the formula:

$$CF_2{=}CF{-}O{-}R_f$$

in which R_f represents one or more perfluoroalkyl radicals having from 1 to 10 atoms or a particulate perfluroinated ether having the formula:



in which n is zero to 4, and, optionally,

(iii) hexafluoropropylene; and

(c) 0–25% of a polymer having a glass-transition temperature greater than or equal to 130° C. which is also thermally stable at temperatures up to 200° C.;

and wherein the other coats are derived from a composition consisting essentially of (a), (b) and (c), with the concentration of (b) being at least 10% by weight, and also less than or equal to 0.75 times the proportion of (b) in the basecoat composition, and the concentration of (c) being 0–15%.

4,351,883

COMPOSITIONS FOR TREATING ALUMINUM SURFACES FOR TARNISH RESISTANCE

Arnold F. Marcantonio; Paul J. Kress, and John W. Powers, all of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Division of Ser. No. 161,794, Jun. 23, 1980, Pat. No. 4,341,878, which is a continuation of Ser. No. 5,280, Jan. 22, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,037
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—450 **16 Claims**

1. A method of treating an aluminum surface to impart tarnish resistance thereto by the steps of contacting said surface with a solution comprising about 0.01 to about 10 weight percent of a water-soluble portion containing about 10 to about 95 weight percent of an alkali metal silicate and about 5 to about 90 weight percent of an organic polymer selected from the group consisting of poly(acrylic-co-acrylate), poly(vinyl alcohol), poly(acrylic acid), poly(acrylamide), poly(maleic anhydride-co-methylvinyl ether), and poly(styrene sulfonic acid), and about 90 to about 99.99 weight percent water and thereafter washing away said solution.

4,351,884

SHAPED ARTICLES FROM POLY(P-METHYLSTYRENE) BLENDS

Arthur B. Robertson, Hillsborough, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,600
Int. Cl.³ B32B *27/32*
U.S. Cl. 204—159.12 **4 Claims**

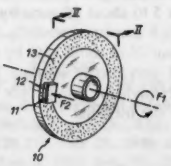
1. Shaped articles of a blend of poly(p-methylstyrene) and between about 0.1 percent and about 10 percent triallyl cyanurate or triallyl isocyanurate thermoformed and irradiated with ionizing radiation between about 5 megarads and about 30 megarads to effect cross-linking to render the shaped article resistant to fatty foods under microwave oven conditions.

4,351,885

METHOD OF IMPROVING FRICTION CONTACT BETWEEN FRICTION ELEMENTS OF A STATIC BRAKE AND IMPROVED FRICTION ELEMENT

Jean-Claude Depoisier, Paris, and Leonce E. R. Rogier, Saint-Denis, both of France, assignors to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Oct. 3, 1979, Ser. No. 81,360
Claims priority, application France, Oct. 3, 1978, 78 28234
Int. Cl.³ B22F *5/00;* F16D *69/00*
U.S. Cl. 428—544 **7 Claims**



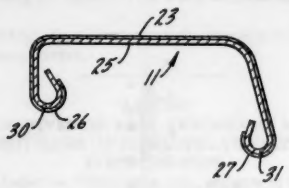
1. A method of providing an improved friction surface on a metallic friction element for use in so-called static braking with an opposed friction element, comprising metal-spraying a metallic substance on a surface of said metallic friction element thereby forming asperities the average roughness Ra of which ranges between 3 and 60 microns, and utilizing said as sprayed metallic substance as a braking surface.

4,351,886

METHOD OF FORMING A LAMINATED STRUCTURAL MEMBER AND MEMBER FORMED THEREBY

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Jul. 11, 1980, Ser. No. 167,420
Int. Cl.[3] B65D 25/28; A47B 95/02
U.S. Cl. 428—591 13 Claims



1. A method of forming a laminated structural member including the steps of:
superimposing a first sheet of metal on a second sheet of metal,
attaching said first sheet of metal and said second sheet of metal to each other along areas spaced from and generally parallel to each other, and
forming at least one bend in said attached sheets of metal between said attached areas with the concave side of said bend being located on the second side sheet of laminate in order to stretch said first sheet of metal through a greater distance than said second sheet of metal is stretched by the forming of the bend.

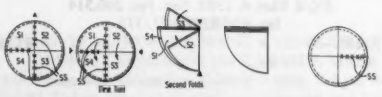
7. A laminated structural member including:
a strengthening core bent to a non-planar cross-section,
the convex side of said bent core being covered by a metal sheet having appearance characteristics and/or finish accepting characteristics more desirable than those of said core,
said metal sheet covering being attached to said core only on opposite sides of said bend and being stretched into conformity with the convex surface of said core.

4,351,887

FOLDABLE METALLIC GAUZE PACK AND SEGMENT

David C. Bishop, London, and Alan E. Heywood, St. Albans, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Apr. 22, 1980, Ser. No. 143,480
Claims priority, application United Kingdom, May 3, 1979, 7915468
Int. Cl.[3] B32B 3/04
U.S. Cl. 428—594 10 Claims



1. A gauze pack segment for use in an assembly of a foldable gauze pack, the said segment being suitable for locating in a plane with similar segments and in edge to edge contiguous relationship with at least one adjacent segment to form a gauze pack having a predetermined geometric shape, the pack segment comprising a plurality of superposed gauze segments having at least when assembled substantially identical shape and area and held in fixed relationship one with another, in which at least two adjacent segments are hingeably connected, alternate gauze segments being woven from a first metallic material with a gauze segment woven from a second metallic material being interleaved between said alternate gauze segments, each said gauze segment having the form of a sector of a circle.

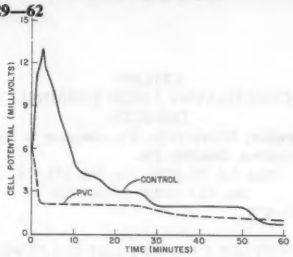
10. A foldable gauze pack having a regular geometric shape and comprising at least two pack segments in which at least two adjacent segments are hingeably connected, comprising a plurality of superposed gauze segments having at least when assembled substantially identical shape and area and held in fixed relationship one with another, alternate gauze segments being woven from a first material with a gauze segment woven from a second material being interleaved between said alternate gauze segments, the said first material comprising an oxidation-resistant stainless steel support material and the second material comprising a getter alloy consisting essentially of gold and palladium.

4,351,888

ELECTROCHEMICAL CELL

Frederick W. Dampier, Waltham, and Risty T. Kalivas, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 30, 1981, Ser. No. 288,612
Int. Cl.[3] H01M 6/14
U.S. Cl. 429—62 10 Claims



1. An electrochemical cell comprising
an oxidizable anode material;
a cathode current collector;
an electrolytic solution, in contact with the anode material and the cathode current collector, comprising a solvent of a reducible liquid cathode material and an electrolyte solute dissolved therein; and
an additive dispersed throughout the electrolytic solution, said additive including material which is substantially insoluble in the electrolytic solution during normal operation of the cell and which becomes soluble in the electrolytic solution at temperatures above the temperature produced by normal operation of the cell whereby current flow through the cell is limited.

4,351,889

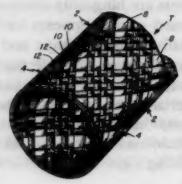
TUBULAR BODIES FOR USE IN A POSITIVE PLATE OF A LEAD-ACID STORAGE BATTERY

Erik G. Sundberg, Newtown Crossing, Pa., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Continuation-in-part of Ser. No. 144,258, Apr. 28, 1980, abandoned. This application Jun. 11, 1981, Ser. No. 272,753
Int. Cl.[3] H01M 2/18
U.S. Cl. 429—141 14 Claims

1. A textured tubular body comprising a latticework of spaced apart tapes selected from the group consisting of a thermoplastic material, unpolymerized phenolic resins, unpolymerized polyesters, unpolymerized epoxy resins, and unpolymerized furan resins, said tapes having reinforcing means included internally therein, the said tapes being interwoven to define interrupted rows of spaces, a foraminous material selected from the group consisting of glass fiber, polyester and mixtures thereof and comprising means for retaining active

material and arranged to fill the spaces in the said rows, said reinforced tapes characterized by the ability to undergo inte-



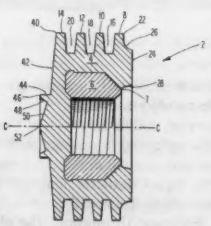
gration with one another in response to externally applied means.

4,351,890

BATTERY CASE HAVING A SIDE TERMINAL MOLDED THEREIN

Terry Oxenreider, Wernersville, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Jul. 31, 1980, Ser. No. 174,126
Int. Cl.[3] H01M *2/06, 2/30*
U.S. Cl. 429—179 2 Claims



1. A battery container with a terminal for making the terminal electrical connection with an end element of the battery associated with an upstanding portion of a battery strap through the side wall of the battery container, said battery container side wall having an exterior surface and an interior surface and said terminal molded therein, said terminal comprising;

a unitary body having circumferential lock means wherein said unitary body has a forward face associated with said exterior surface and a rearward portion associated with said interior surface for completing the electrical connection with said end element adjacent to said interior surface;

said rearward portion further comprising a border portion substantially co-planar with said interior surface and a node portion, said node portion further comprising a base recessed from said interior surface and a conical portion extending from said base, and said conical portion extending from said base to a plane substantially co-planar with said interior surface;

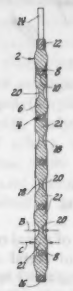
whereby the upstanding portion of the battery strap associated with said end element is placed against said interior surface and said upstanding portion is welded to said rearward portion.

4,351,891

LEAD-ACID STORAGE BATTERY PLATE AND METHOD OF MAKING SAME

Charles P. McCartney, Jr., Yorktown, and Ellis G. Wheadon, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1981, Ser. No. 250,412
Int. Cl.[3] H01M *4/30*
U.S. Cl. 429—225 2 Claims



1. In a Pb-acid storage battery electrode including a conductive grid supporting the plates active material and a leady active material embedding said grid such as to form a substantially planar plate defined by two principal faces on opposite sides of the plate, the improvement comprising:

said grid comprising a network of crisscrossing interconnected grid wires defining a plurality of interstitial openings between said grid wires for retaining said active material; and a

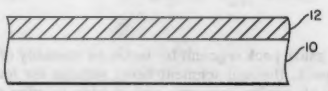
plurality of dimples in, and distributed substantially uniformly across, at least one of said faces, said dimples each being located at the approximate center of a said opening to provide a lesser amount of said active material in the center of said opening remote from the grid wires surrounding said opening than is provided in the regions of said plate outboard said dimple and proximate said surrounding grid wires; whereby a plate having improved active material utilization efficiency and capacity is produced.

4,351,892

ALIGNMENT TARGET FOR ELECTRON-BEAM WRITE SYSTEM

T. Grant Davis, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 4, 1981, Ser. No. 260,514
Int. Cl.[3] H01L *21/312*
U.S. Cl. 430—30 9 Claims



1. A method for aligning an electron beam of an electron-beam direct write system with a wafer of semiconductor material, comprising:

(a) forming an alignment target on the wafer by the steps of

(i) forming a layer of silicon oxide on a surface of said wafer;

(ii) forming a layer of silicon nitride on said oxide layer;

(iii) etching an opening in said nitride layer to expose a surface portion of said oxide layer;

(iv) etching said exposed surface portion to form a hole in said oxide layer, said hole being formed such that said oxide layer is undercut beneath said silicon nitride layer such that a cantilevered silicon nitride overhang is formed around the perimeter of said hole; and

(v) depositing a layer of aluminum over said nitride layer;

(b) scanning the surface of the wafer with the electron beam; and

(c) detecting the alignment of the electron beam with the alignment target.

4,351,893

DERIVATIVES OF ARYL KETONES AS VISIBLE SENSITIZERS OF PHOTOPOLYMERIZABLE COMPOSITIONS

Albert G. Anderson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1980, Ser. No. 221,887

Int. Cl.³ G03C *1/68*

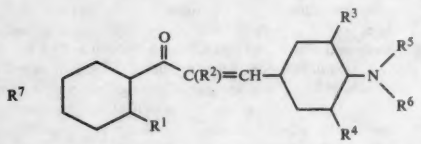
U.S. Cl. 430—281 **9 Claims**

1. A photopolymerizable composition comprising the components:

(i) at least one nongaseous ethylenically unsaturated compound capable of forming a high molecular weight polymer by photoinitiated addition polymerization;

(ii) at least one 2,4,5-triarylimidazolyl dimer initiator consisting of two 2,4,5-triarylimidazolyl radicals bound together by a single covalent bond; and

(iii) at least one α,β-unsaturated ketone sensitizer having the formula



wherein

R^1 and R^2 are each H, or R^1+R^2 is $—CH_2—$;

R^3 is H, or R^3+R^5 is selected from $—CH_2—_2$, $—CH_2—_3$, and $—CH(CH_3)CH_2C(CH_3)_2—$;

R^4 is H, or R^4+R^6 is selected from $—CH_2—_2$ and $—CH_2—_3$;

R^5 and R^6 are alkyl groups of 1 to 5 carbon atoms, or together are selected from $—CH_2—_4$ and $—CH_2CH_2OCH_2CH_2—$;

R^7, having a total of up to 8 carbon atoms, is selected from trimethylene and tetramethylene groups, unsubstituted, or substituted with 1 to 4 alkyl groups.

4,351,894

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE USING SILICON CARBIDE MASK

Toshio Yonezawa, Yokosuka; Takashi Ajima, Tokyo; Shunichi Hiraki, Yokohama; Yutaka Koshino, Ohizumi, and Yoshitami Oka, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 47,216, Jun. 11, 1979, abandoned, which is a continuation of Ser. No. 827,347, Aug. 24, 1977, abandoned. This application May 12, 1981, Ser. No. 262,938

Claims priority, application Japan, Aug. 27, 1976, 51/102430; Oct. 26, 1976, 51/127808; Oct. 26, 1976, 51/127809

Int. Cl.³ H01L *21/314, 21/316*

U.S. Cl. 430—313 **14 Claims**

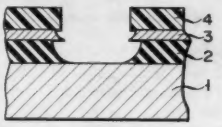
1. A method of preparing a silicon dioxide film perforated in a prescribed pattern, the film to be used as a mask on the surface of semiconductor material for manufacture of a dimensionally precise semiconductor device, the method comprising:

(a) forming a silicon dioxide film substantially covering the surface of the semiconductor material,

(b) forming a silicon carbide film substantially and adheringly covering said silicon dioxide film,

(c) forming a photoresist mask perforated in the prescribed pattern on said silicon carbide film,

(d) perforating said silicon carbide film in the prescribed



pattern using said photoresist mask, thereby providing a silicon carbide mask for said silicon dioxide film, and

(e) selectively etching said silicon dioxide film using hydrofluoric acid or ammonium fluoride through the perforations having the prescribed pattern in said silicon carbide mask, thereby providing a dimensionally precise silicon dioxide mask for diffusion of an impurity or deposition of an electrode.

4,351,895

DELETION FLUID FOR POSITIVE PRINTING PLATES

John E. Walls, Annandale, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Oct. 19, 1981, Ser. No. 312,450

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—331 **10 Claims**

1. A deletion fluid for positive working photographic elements which comprises an aqueous solution containing:

(a) a gum which is soluble both in water and a compound selected from the group consisting of one or more aliphatic alcohols, acetates and ethers; and

(b) at least one compound selected from the group consisting of cyclohexanone, and compounds having the formula:

$$R_1(CH_2CH_2O)_nR_2$$

where

n=1–10

$R_1=CH_3O,CH_3(CH_2)_mO$, where m=1–3

$R_2=R_1,—OH,CH_3COO—$

(c) a thixotropic agent capable of creating weak hydrogen bonding between itself and the hydroxyl groups of said gum; and

(d) a desensitizing agent selected from the group consisting of morpholine, aniline, chloro-aniline, bromo-aniline, methyl-aniline and compounds having the formula:

where

$R_1=H,—CH_2CH_2OH,—CH_2CH_3$

$R_2=R_1$

$R_3=R_1,(CH_2)_nNH_2(n=1–6)$.

4,351,896

MESOIONIC SILVER HALIDE STABILIZER PRECURSOR AND USE IN A HEAT DEVELOPABLE AND HEAT STABILIZABLE PHOTOGRAPHIC SILVER HALIDE MATERIAL AND PROCESS

Henry W. Altland, Rochester, and Daniel D. Shiao, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 215,783, Dec. 12, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,566

Int. Cl.³ G03C *5/30*

U.S. Cl. 430—354 **20 Claims**

1. In a heat developable and heat stabilizable photographic silver halide element comprising a support having thereon, in reactive association, in binder:

(a) photographic silver halide,

(b) a photographic silver halide developing agent,

(c) an activating concentration of a thermal base releasing compound,

the improvement comprising

(d) a stabilizing concentration of a mesoionic 1,2,4-triazolium-3-thiolate silver halide stabilizer precursor containing a heat releasable blocking group on the sulfur atom.

4,351,897

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kozo Aoki; Nobuo Seto; Yoshiharu Yabuki; Masakazu Morigaki; Nobuo Furutachi, and Kotaro Nakamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

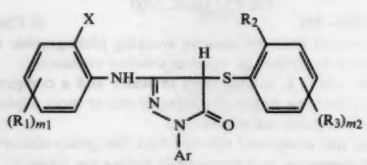
Filed Aug. 11, 1981, Ser. No. 291,886

Claims priority, application Japan, Aug. 12, 1980, 55-110943

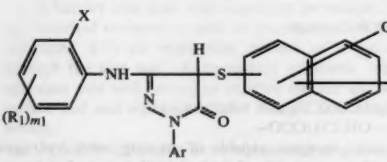
Int. Cl.³ G03C *1/40*

U.S. Cl. 430—555 **22 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a photographic layer containing at least one coupler represented by formula (I) or (II)



(I)



(II)

wherein Ar represents a phenyl group substituted with at least one substituent selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, an alkoxycarbonyl group, and a cyano group; X represents a halogen atom or an alkoxy group; R_1 represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an acylamino group, a sulfonamido group, a sulfamoyl group, a carbamoyl group, a diacylamino group, an alkoxycarbonyl group, an alkoxysulfonyl group, an aryloxysulfonyl group, an alkanesulfonyl group, an arylsulfonyl group, an alkylthio group, an arylthio group, an alkyloxycarbonylamino group, an alkylureido group, an acyl group, a nitro group, a carboxy group, or a trifluoromethyl group; R_2 represents a halogen atom, a hydroxy group, an alkyl group, an alkoxy group, or an aryl group; R_3 represents a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group, an alkoxy group or an aryl group; at least one of R_2 and R_3 represents an alkoxy group; m_1 and m_2 each represents an integer from 1 to 4; R_4 represents an alkyl group or an aryl group; R_5 represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an aryl group; n represents an integer from 1 to 6; and when m_1, m_2 and n each is 2 or more, each R_1, R_3 and R_5 may be the same or different.

4,351,898

MIXED GRAIN SINGLE EMULSION LAYER PHOTOGRAPHIC MATERIAL

Richard J. Goldberg, 4814 Brandenburg Pl., Tarzana, Calif. 91356

Filed Jan. 3, 1978, Ser. No. 866,272

Int. Cl.³ G03C *1/08, 1/34*

U.S. Cl. 430—571 **3 Claims**

1. A mixed grain photographic emulsion capable of simultaneous exposure in all spectral regions and for use with chemical photographic developers, said emulsion containing metallic silver and silver ions and comprising:

a first emulsion component sensitive to the wavelength, intensity or color of light;

a second emulsion component having a sensitivity to the wavelength, intensity or color of light that is different from said sensitivity to the first emulsion component;

a third emulsion component having a sensitivity to the wavelength, intensity or color of light that is different from said sensitivity of the first and second emulsion components;

an antifoggant in at least two of said emulsion components to provide different levels of antifoggant activity in each emulsion component, said antifoggant comprised of molecules having a portion which is hydrophillic as to metallic silver and silver ions and a portion which is hydrophobic as to said developers, whereby said antifoggant molecules are adsorbed on said metallic silver and silver ions by said hydrophillic portion, and the action of the developers on the metallic silver and silver ions is separately and sequentially inhibited by said hydrophobic portion, thereby permitting each emulsion component to be developed separately and sequentially by said developers.

4,351,899

SEMI-QUANTITATIVE ASSAY OF METABOLIC ACIDS

Oliver E. Owen, 1401 Spring Mill Rd., Gladwyne, Pa. 19035

Continuation-in-part of Ser. No. 925,946, Jul. 19, 1978, Pat. No. 4,254,222. This application Feb. 19, 1981, Ser. No. 235,776

Int. Cl.³ C12Q *1/32*

U.S. Cl. 435—26 **16 Claims**

1. A test indicator for determining the concentration of a metabolic acid selected from the group consisting of beta-hydroxybutyrate and lactic acid in a biological fluid, such indicator comprising:

(a) a first absorbant test surface containing the dried residue resulting from impregnation of the surface with components including

(i) a tetrazolium salt;

(ii) nicotinamide adenine dinucleotide (NAD);

(iii) an electron carrier;

(iv) the enzyme that is a dehydrogenase for the metabolic acid; and

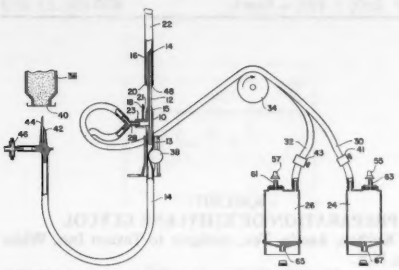
(b) means, distinct from the first absorbant test surface, for buffering the biological fluid, wherein said recited components are present in amounts sufficient to react together to determine the concentration of said acid.

4,351,900

TEST METHOD AND APPARATUS FOR THE PRESENCE OF MICROORGANISMS IN AMPOULE

Jean Lemonnier, Le Vesinet, France, assignor to Millipore Corporation, Bedford, Mass.

Filed Jan. 30, 1981, Ser. No. 229,918
Int. Cl.³ C12Q *1/22*
U.S. Cl. 435—31 **8 Claims**



1. Apparatus for testing the sterility of the dry contents of a container which comprises a tubular member, a spout positioned at an intermediate point along said tubular member, a needle having a first channel and a second channel, said first channel being longer than said second channel, said needle being positioned within said tubular member to provide fluid communication through said tubular member through said first channel into said container and said second channel positioned to provide fluid communication from said container to said spout.

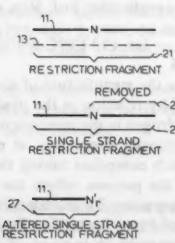
4. The process for testing the sterility of the dry contents of a container having a seal which comprises penetrating the seal with a dual channel needle, said needle being positioned within a tubular member having a spout communicating with the interior of said tubular member, passing a liquid capable of dissolving said dry contents through a first channel of said needle to form a solution within said container, passing a sterile rinsing solution through said first channel thereby to force said solution through a second channel of said needle and through said spout, passing said solution from said spout through a filter under sterile conditions, contacting said filter with a growth medium incubating said growth medium and filtered material under sterile conditions and observing the extent of growth on said medium.

4,351,901

METHOD FOR SINGLE NUCLEOTIDE ALTERATION

Chander P. Bahl, El Cerrito, Calif., assignor to Cetus Corporation, Berkeley, Calif.

Filed Mar. 24, 1980, Ser. No. 133,150
Int. Cl.³ C12N *15/00*
U.S. Cl. 435—91 **18 Claims**



1. A method for altering a nucleotide at a predetermined position in a gene, comprising, isolating single strand fragments of the gene, each having a substantial number of bases on the 5′ side of the predetermined position and terminating with the base immediately prior to the predetermined position, attaching a nucleotide corresponding to the desired altered nucleotide to each of the isolated fragments at the predetermined position, providing single strand templates of DNA each corresponding to at least a portion of the strand of the gene complementary to the strand having the isolated fragment, each template having a first part complementary to the isolated fragment and a second part extending at least a substantial number of bases past the predetermined position, annealing the isolated fragments to the first parts of the templates, and producing mismatched double-stranded DNA containing altered nucleotides at the predetermined position by extending the isolated fragments beyond the predetermined position complementary to the second parts of the templates.

4,351,902

PRODUCTION OF 2-KETO-D-GLUCONIC ACID AND HYDROGEN PEROXIDE

Saul L. Neidleman, Oakland; William F. Amon, Jr., Danville, and John Geigert, Clayton, all of Calif., assignors to Cetus Corporation, Berkeley, Calif.

Filed Jun. 16, 1980, Ser. No. 160,122
Int. Cl.³ C12P *7/58, 3/00, 7/26*
U.S. Cl. 435—137 **10 Claims**

1. A process for producing hydrogen peroxide and 2-keto-D-gluconic acid, comprising, reacting D-glucose in aqueous solution with oxygen and a first enzyme selected from the group consisting of pyranose-2-oxidase, glucose-2-oxidase, and glucose-1-oxidase to catalize oxidation of one of the first and second carbons of the D-glucose and produce an intermediate product comprising D-glucosone or D-glucono-δ-lactone, reacting the intermediate product in aqueous solution with oxygen and a second enzyme selected from the group consisting of pyranose-2-oxidase and glucose-1-oxidase to catalyze oxidation of the other of the first and second carbons of the intermediate product and produce hydrogen peroxide and 2-keto-D-gluconic acid, and recovering the 2-keto-D-gluconic acid.

4,351,903

PROCESS FOR OBTAINING GLUCOSE-ISOMERASE

Nieves LLorente Agudo; Maria F. Elia Miguel; Maria A. Aranguren Escobar; Eulalia Parés Olivet, and José M. Fernández Garvajosa, all of Madrid, Spain, assignors to Compania Espanola de Petroleos, S.A., Spain

Filed Oct. 31, 1980, Ser. No. 202,766
Claims priority, application Spain, Oct. 31, 1979, 485.580
Int. Cl.³ C12N *9/92*
U.S. Cl. 435—234 **11 Claims**

1. Process for producing glucose-isomerase, which comprises culturing continuously or discontinuously, under aerobic conditions, a strain of the species *Streptomyces griseoflavus* A-40 (NCIB-11542) in a culture medium and recovering glucose-isomerase from said medium.

4,351,904

BLEND OF NORMAL AND MUTANT *STREPTOCOCCUS DIACETILACTIS*

Edmond L. Sing, 3860 Cheviot Pl., Indianapolis, Ind. 46226

Division of Ser. No. 137,243, Apr. 4, 1980, Pat. No. 4,319,928, which is a continuation-in-part of Ser. No. 105,102, Dec. 19, 1979, abandoned. This application Jul. 9, 1981, Ser. No. 281,915
Int. Cl.³ C12N *1/20;* A23C *19/06*
U.S. Cl. 435—253 **5 Claims**

1. A bacteria-containing composition which comprises:

(a) from 5 to 95 parts of a first strain of *Streptococcus diacetilactis* that produces substantial amounts of diacetyl in a milk culture;

(b) from 5 to 95 parts of a second strain of diacetyl deficient mutant *Streptococcus diacetilactis* selected from the group consisting of mutant strains NRRL B-12070 and NRRL B-12071 that produces essentially no diacetyl in a milk culture; and

(c) additional parts of a suitable carrier for maintenance of viability, and

said composition having over 3×10^9 cells of *Streptococcus diacetilactis* per gram of said composition.

4,351,905

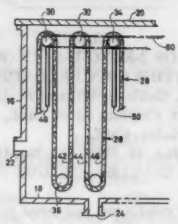
HORIZONTAL FERMENTER

Robert A. Clyde, Box 486, Alfred, N.Y. 14802

Filed Dec. 15, 1980, Ser. No. 216,310

Int. Cl.³ C12M *1/02*

U.S. Cl. 435—316 **16 Claims**



1. A fermenter for allowing the uninhibited growth of an organism suitable for converting a selected nutrient medium into a selected chemical comprising:

a nutrient medium;

a container for containing said nutrient medium, said container including a port for receiving said nutrient medium, exhaust ports for discharging a flow of excess organisms, and CO_2, and a port for removing said selected chemical;

a support substrate, said substrate comprising a multiplicity of fibers for supporting and having attached thereto said selected organisms;

means for supporting said substrate within said container; and

means for physically detaching said organisms from said support substrate.

4,351,906

OPHTHALMIC GLASSES WITH HIGH INDICES OF REFRACTION

Jean E. Boudot; Jean P. Mazeau, both of Avon, and Andre C. Michaud, Nemours, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,771

Claims priority, application France, Jun. 24, 1981, 81 12383

Int. Cl.³ C03C *3/10*

U.S. Cl. 501—74 **3 Claims**

1. A glass suitable for the fabrication of segments or buttons for multifocal ophthalmic lenses having a refractive index between 1.745–1.771, an Abbe number greater than 29 for a refractive index of 1.771 and greater than 31 for a refractive index of 1.745, a softening temperature between approximately 640°–700° C., a coefficient of thermal expansion (25°–300° C.) of approximately $90–98\times10^{-7}$/°C. and satisfactory chemical durability, which consists essentially, espressed in terms of weight percent on the oxide basis, of

SiO_2	28–32.5
Na_2O	2–9
K_2O	0–4
Li_2O	0–1
$K_2O + Na_2O + Li_2O$	4–10.5
BaO	0–22
La_2O_3	0–20
$BaO + La_2O_3$	14–22
PbO	28.5–34
ZnO	0–4
TiO_2	0–9
ZrO_2	2–6.5
Nb_2O_5	0–10
$TiO_2 + Nb_2O_5$	4.5–12
$ZrO_2 + TiO_2 + Nb_2O_5$	6–17

4,351,907

PREPARATION OF ETHYLENE GLYCOL

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 219,073, Dec. 22, 1980, Pat. No. 4,315,993. This application Aug. 31, 1981, Ser. No. 297,545

Int. Cl.³ C07C *27/06, 41/01*

U.S. Cl. 518—700 **10 Claims**

1. A process for the preparation of ethylene glycol ethers which comprises reacting carbon monoxide and hydrogen in the presence of a ruthenium compound, a mineral acid and one or more polyhydric phenols at a temperature of about 125° to about 300° C. and at a pressure of about 1000 psi to about 10,000 psi and wherein the said reaction is conducted in the presence of a solvent having the formula:

$$R\,(OCH_2CH_2)_nOR'$$

wherein R is alkyl having 1 to 4 inclusive carbon atoms and R′ is selected from the group consisting of hydrogen and alkyl having 1 to 4 inclusive carbon atoms, and n is an integer of from 2 to 4 inclusive.

4,351,908

PROCESS FOR THE MANUFACTURE OF ACETIC ACID, ACETIC ALDEHYDE AND ETHANOL FROM SYNTHESIS GAS

Hans-Joachim Schmidt, Königstein, and Ernst J. Leupold, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,073

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038448

Int. Cl.³ C07C *27/06*

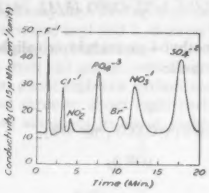
U.S. Cl. 518—716 **2 Claims**

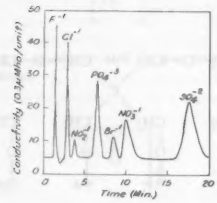
1. A process for the manufacture of acetic acid, acetic aldehyde and ethanol by reaction in the gaseous phase of carbon monoxide and hydrogen in the presence of catalysts containing rhodium and optionally promoters, at elevated temperature and pressure, which comprises raising the temperature in the starting phase of the process, where the catalyst is heated to the working temperature T_R intended for continuous operation, in a range of from T_O to T_R, T_O being 75° to 125° C. below T_R, continuously or in steps of 10° C. at most, in a period of time of from 100 to 1,000 hours; the temperature being raised by 10° C. at most within any 10 hour interval.

4,351,909
HIGH PERFORMANCE ION-EXCHANGE COMPOSITION

Timothy S. Stevens, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich. and Dionex Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 80,909, Oct. 1, 1979, abandoned. This application May 21, 1981, Ser. No. 265,762
Int. Cl.³ B01J 39/06, 41/06, 47/02
U.S. Cl. 521—28 9 Claims





1. A composition of matter for exchanging ions comprising:

Component A, a substrate which consists essentially of macroporous synthetic resin, having ion-exchanging sites at least on its available surface, having a volume average pore diameter of X; and

Component B, finely divided synthetic resin particles having a volume average diameter (D) less than 0.08 micron and greater than 0.005 micron and having, at least on their outer surfaces, ion-exchanging sites which attract available sites of Component A; wherein the particles of Component B are irreversibly attached as a monolayer to the available surface of Component A;

provided that, the ratio X/D is from about 4 to about 30.

4,351,910
EXPANDABLE STYRENE SERIES RESIN COMPOSITION AND PROCESS FOR PRODUCTION THEREOF

Hatuo Sugitani, Ibaraki; Takeo Kudo; Yoshiyuki Mukoyama, both of Hitachi, and Hiromasa Kawai, Ichihara, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 287,915
Claims priority, application Japan, Jul. 29, 1980, 55-104539; Sep. 19, 1980, 55-131323; Apr. 2, 1981, 56-50428
Int. Cl.³ C08J 9/18, 9/20
U.S. Cl. 521—56 22 Claims

1. An expandable styrene series resin composition comprising a styrene series resin containing in its molecular structure one or more groups of the formula:

$$-SiY_nR_{3-n} \quad (I)$$

wherein R is an inert monovalent organic group; Y is a hydrolyzable group; and n is an integer of 1 to 3, and a blowing agent, said group or groups being chemically bonded to the molecular structure of the styrene series resin by addition polymerization, by graft polymerization or by free radicals.

4,351,911
FOAMABLE POLYESTER COMPOSITION

Daniel W. Fox, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 78,379, Sep. 24, 1979, abandoned, which is a continuation of Ser. No. 897,145, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 486,212, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 375,770, Jul. 2, 1973, abandoned. This application Aug. 1, 1980, Ser. No. 174,604
Int. Cl.³ C08L 67/00
U.S. Cl. 521—138 13 Claims

1. A foamable thermoplastic injection moldable composition consisting essentially of an admixture of:

(a) a polyester resin selected from the group consisting of (1) a poly(ethylene terephthalate) resin or a copolyester thereof, (2) a combination of a poly(ethylene terephthalate) resin and a poly(1,4-butylene terephthalate) resin or copolyesters thereof and (3) a combination of a poly(1,4-butylene terephthalate) resin or a copolyester thereof and a linear aliphatic polyester resin;

(b) a filler selected from the group consisting of fibrous glass or a mineral or mixtures thereof in an amount of from about 5 to about 50 weight percent; and

(c) a minor amount of a foaming agent selected from the group consisting of dinitrosopentamethylene tetramine, p-toluene sulfonyl semicarbazide, 5-phenyltetrazole, calcium oxalate and trihydrazino-s-triazine said amount being sufficient to provide a rigid cellular core within a solid integral skin.

4,351,912
STUCCO COMPOSITION

F. Bon Jasperson, Fort Lauderdale, Fla., assignor to Northwood Mills Ltd., Toronto, Canada

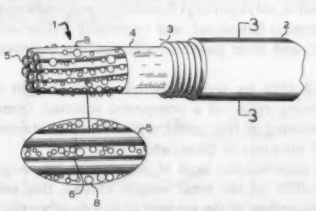
Filed Apr. 20, 1981, Ser. No. 255,834
Int. Cl.³ C08K 3/34
U.S. Cl. 523—218 18 Claims

1. A trowelable, lightweight synthetic stucco composition for producing a lightweight stucco finish consisting essentially of a pigmented latex paint, a texturizing amount of a crushable, lightweight aggregate of a texturizing particle size, and a protective amount of a hard, non-crushable aggregate of a protective particle size, the crushable aggregate being present in an amount of more than 40% of the total weight of aggregate and pigment in said composition, wherein the hard aggregate protects the crushable aggregate from substantial particle size reduction upon troweling.

4,351,913
FILLING MATERIALS FOR ELECTRICAL AND LIGHT WAVEGUIDE COMMUNICATIONS CABLES

Naren I. Patel, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Division of Ser. No. 235,922, Feb. 19, 1981, Pat. No. 4,324,453. This application Jan. 4, 1982, Ser. No. 336,560
Int. Cl.³ C08J 9/32
U.S. Cl. 523—218 3 Claims



1. A composition of matter composed of a mixture consisting

essentially of of a styrene block copolymer rubber, mineral oil, and inorganic hollow microspheres, wherein:

(a) the amount and type of said block copolymer rubber is either:

(i) 1 to 30 percent by weight of styrene-ethylene-butylene-styrene block copolymer having a styrene to rubber ratio of approximately 0.4 and a specific gravity of approximately 0.9;

(ii) 7 to 10 percent by weight of styrene-butadiene-styrene block copolymer having a styrene to rubber ratio of approximately 0.39 and a specific gravity of approximately 0.94; and

(iii) 8 to 12 percent by weight of styrene-isoprene-styrene block copolymer having a styrene to rubber ratio of approximately 0.16 and a specific gravity of approximately 0.92;

(b) wherein said mineral oil is either:

(i) 60 to 80 percent by weight of paraffinic mineral oil having a viscosity-gravity constant (ASTM D 2501-67) of approximately 0.78 to 0.85 with a minimum of 65 percent paraffinic carbon atoms and a maximum of 5 percent aromatic carbon atoms; or

(ii) 60 to 80 percent by weight of naphthenic mineral oil having a viscosity-gravity constant (ASTM D 2501-67) of approximately 0.78 to 0.85 with a minimum of 35 percent naphthenic carbon atoms and a maximum of 5 percent aromatic carbon atoms; and

(c) said inorganic hollow microspheres are either:

(i) 1 to 20 percent by weight of inorganic hollow microspheres made from glass, having a particle diameter between 10 and 200 microns and a particle density range of approximately 0.1 to 0.3 g/cm^3; or

(ii) up to 35 percent by weight of inorganic hollow microspheres made from ceramic materials, having a particle diameter between 60 and 325 microns and a particle density of approximately 0.6 g/cm^3.

4,351,914
CORROSION-RESISTANT, IMPROVED POWDER PRIMER SURFACER

Ram-Tirth Khanna, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1981, Ser. No. 247,135
Int. Cl.^{3} C08L *63/02*
U.S. Cl. 523—448 **14 Claims**

1. An improved corrosion-resistant powder coating composition of the kind consisting essentially of finely divided powder particles of a blend of an epoxy functional film-forming resin, an approximately stoichiometric amount of a curing agent that is polyhydroxyl functional, polycarboxyl functional, or polyamino functional, and optionally a flow control agent, pigment, and filler particles wherein the improvement comprises:

(A) 12–45% by weight, based on the weight of the film-forming resin, of a compound selected from the group consisting of zinc oxide, a zinc oxide-containing complex, and mixtures of these; and

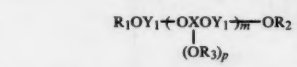
(B) a dicarboxylic acid in an amount by weight equal to 0.5–10% of the total weight of (A), this amount being independent of the amount of any dicarboxylic acid which may be present as the curing agent.

4,351,915
2,2,6,6-TETRAMETHYL-4-PIPERIDYL SPIRO ALIPHATIC ETHERS AS STABILIZERS FOR SYNTHETIC POLYMERS

Naohiro Kubota, Ageo; Toshihiro Shibata, Omiya; Kazuo Sugibuchi, Tokyo, and Motonubu Minagawa, Koshigaya, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed May 26, 1981, Ser. No. 267,138
Claims priority, application Japan, May 30, 1980, 55-72875
Int. Cl.^{3} C07D *491/10*; C07F *5/04, 7/10, 9/65*; C08K *5/34, 5/46, 5/52, 5/53, 5/54, 5/55*; C08G *18/32, 18/38, 63/68, 65/40*
U.S. Cl. 524—103 **43 Claims**

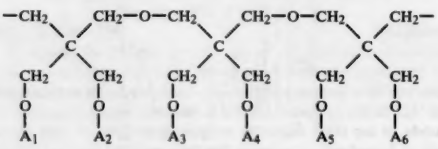
1. 2,2,6,6-Tetramethyl-4-piperidyl spiro aliphatic ethers having the general formula:



(I)

wherein:

Y_1 is



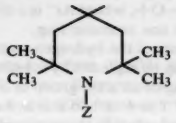
A_1, A_2, A_3, A_4, A_5, and A_6 each are selected from the group consisting of hydrogen; alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; aryl having from about six to about eighteen carbon atoms; acyl having from one to about eighteen carbon atoms

wherein R_4 is selected from the group consisting of aliphatic having from one to about eighteen carbon atoms; cycloaliphatic having from three to about eight carbon atoms; heterocyclic having from six to about eighteen carbon atoms; and aromatic having from six to about eighteen carbon atoms; carbamoyl

wherein R_5 is selected from the group consisting of aliphatic having from one to about eighteen carbon atoms; cycloaliphatic hving from three to about eight carbon atoms; heterocyclic having from six to about eighteen carbon atoms; and aromatic having from six to about eighteen carbon atoms;

and monovalent oxyacid groups;

at least one pair of A_1 and A_2; A_3 and A_4; and A_5 and A_6 being taken together to form the group:



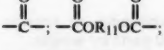
wherein:

Z is selected from the group consisting of hydrogen; oxyl O.; alkyl and hydroxyalkyl having from one to about twenty carbon atoms; and aryl and hydroxyaryl having from six to about twenty carbon atoms;

X is selected from the group consisting of alkylene having from one to about eighteen carbon atoms; cycloalkylene having from three to about eight carbon atoms; arylene having from about six to about eighteen carbon atoms; polyacyl

wherein R_4 is as above and n_1 is a number from 2 to 4; polycarbamoyl

wherein R_5 is as above and n_2 is a number from 2 to 4;



and di- and trivalent oxyacid groups;

R_1 and R_2 each are selected from the group consisting of hydrogen; alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; aryl having from about six to about eighteen carbon atoms; carbamoyl

wherein R_5 is selected from the group consisting of aliphatic having from one to about eighteen carbon atoms; cycloaliphatic having from three to about eight carbon atoms; heterocyclic having from six to about eighteen carbon atoms; and aromatic having from six to about eighteen carbon atoms;

and monovalent oxyacid groups;

R_3 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; aryl having from about six to about eighteen carbon atoms; and —X—O—R_1;

R_7 is selected from the group consisting of the residues of monohydric alcohols having from one to about eighteen carbon atoms and phenols having from six to about fifty carbon atoms;

R_{11} is selected from the group consisting of alkylene and oxyalkylene having from two to about ten carbon atoms and from zero to about five oxyether groups; cycloalkylene having from three to about eight carbon atoms; and arylene having from six to about fifty carbon atoms; and isocyanurate;

m is a number from zero to 10; and

p is zero or 1.

34. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a 2,2,6,6-tetramethyl-4-piperidyl spiro aliphatic ether in accordance with claim **1**.

4,351,916

POLYOXYMETHYLENE MOLDING BLENDS

Melvin I. Kohan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 185,409, Sep. 9, 1980, abandoned. This application May 7, 1981, Ser. No. 261,482

Int. Cl.[3] **C08L** *59/07, 77/00, 59/04*

U.S. Cl. 524—377 **8 Claims**

1. A polyoxymethylene blend consisting essentially of

(a) polyoxymethylene,

(b) 0.1–10 percent, preferably 0.5–5 percent, by weight of blend, poly(ethylene glycol), and

(c) 0.15–3 percent, preferably 0.4–2.0 percent, by weight of blend, of a dispersion of polyamide in a carrier resin, the polyamide comprising about from 10 to 50 wt % of the dispersion and being present in the carrier resin as particles no greater than about 5 microns; the carrier resin being inert to the oxymethylene polymer and having a melting point at or below the processing temperature of the oxymethylene polymer.

4,351,917

POLY(ESTER-AMIDE) CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE DERIVED FROM 6-HYDROXY-2-NAPHTHOIC ACID, AROMATIC MONOMER CAPABLE OF FORMING AN AMIDE LINKAGE, AND OTHER AROMATIC HYDROXYACID

Gordon W. Calundann, North Plainfield; Larry F. Charbonneau, Chatham, and Anthony J. East, Madison, all of N.J., assignors to Celanese Corporation, New York, N.Y.

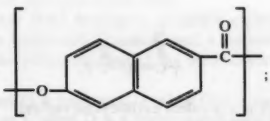
Filed Apr. 6, 1981, Ser. No. 251,625

Int. Cl.[3] **C08G** *69/44*

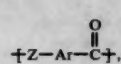
U.S. Cl. 524—602 **33 Claims**

1. A melt processable poly(ester-amide) capable of forming an anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of recurring moieties I, II, and, optionally, III wherein:

I is

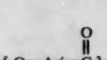


II is



where Ar is a divalent radical comprising at least one aromatic ring, and Z is NH or NR, where R is an alkyl group of 1 to 6 carbon atoms or an aryl group; and

III is



where Ar' is a divalent radical comprising at least one aromatic ring, other than naphthylene;

wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by subtitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures thereof, and wherein moiety I is present in a concentration of approximately 10 to 90 mole percent, moiety II is present in a concentration of approximately 5 to 45 mole percent, and moiety III is present in a concentration of approximately 0 to 45 mole percent, with the total concentration of moieties I and III being within the range of approximately 55 to 95 mole percent.

4,351,918

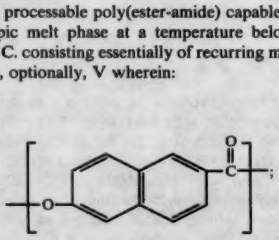
POLY(ESTER-AMIDE) CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE DERIVED FROM 6-HYDROXY-2-NAPHTHOIC ACID, OTHER AROMATIC HYDROXYACID, CARBOCYCLIC DICARBOXYLIC ACID, AND AROMATIC MONOMER CAPABLE OF FORMING AN AMIDE LINKAGE

Larry F. Charbonneau, Chatham; Anthony J. East, Madison, and Gordon W. Calundann, North Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

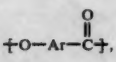
Filed Apr. 6, 1981, Ser. No. 251,629
Int. Cl.³ C08G *69/44*
U.S. Cl. 524—602 **39 Claims**

1. A melt processable poly(ester-amide) capable of forming an anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of recurring moieties I, II, III, IV, and, optionally, V wherein:

I is

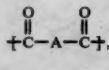


II is



where Ar is a divalent radical comprising at least one aromatic ring other than 2,6-naphthylene;

III is



where A is a divalent carbocyclic radical;

IV is —Y—AR'—Z—, where Ar' is a divalent radical comprising at least one aromatic ring, Y is O, NH, or NR, and Z is NH or NR, where R is an alkyl group of 1 to 6 carbon atoms or an aryl group; and

V is —O—AR''—O—, where Ar'' is a divalent radical comprising at least one aromatic ring,

wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures thereof, and wherein the total molar concentration of moiety I and moiety II in the polymer is within the range of approximately 10 to 90 mole percent, with the molar ratio of moiety I:moiety II being within the range of approximately 1:9 to 9:1, and the total molar concentration of moiety IV and moiety V is substantially equal to the molar concentration of moiety III, with moiety IV being present in a concentration within the range of approximately 5 to 45 mole percent.

4,351,919

PROCESS FOR THE PRODUCTION OF POLYESTER SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 256,317, Apr. 22, 1981, which is a continuation-in-part of Ser. No. 122,015, Feb. 19, 1980, which is a continuation-in-part of Ser. No. 10,061, Feb. 7, 1979, Pat. No. 4,200,697, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Oct. 13, 1981, Ser. No. 310,370
Int. Cl.³ C08L *83/00*
U.S. Cl. 524—858 **16 Claims**

1. An improved process for the production of polyester silicate resinous products containing fine oxidated silicon particles very fine particle size, approximately 5 to 10 microns which comprises mixing and reacting the following components:

(a) organosol containing an organic polyhydroxy compound, 10 to 30 parts by weight;

(b) a polycarboxylic compound selected from the group consisting of polycarboxylic acids, polycarboxylic acid anhydrides and mixtures thereof, 10 to 30 parts by weight.

4,351,920

THERMOPLASTIC RESIN COMPOSITION

Nagao Ariga; Kyotaro Shimazu; Hidenori Takenaka, all of Chiba, and Hiroyuki Sato, Yachiyo, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,434
Int. Cl.³ C08L *51/04, 69/00*
U.S. Cl. 525—67 **12 Claims**

1. A thermoplastic resin composition comprising (a) 5 to 40% by weight of a rubber-modified styrene/maleic anhydride copolymer resin and (b) 95 to 60% by weight of a polycarbonate resin as main components.

4,351,921

RESIN COMPOSITION FOR USE IN UNCOATED EXTERIOR MATERIAL

Kazuo Kishida; Akira Hasegawa, and Yasunori Kawachi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 221,359
Claims priority, application Japan, Jan. 11, 1980, 55-1943
Int. Cl.³ C08L *33/08, 33/12, 51/04*
U.S. Cl. 525—80 **12 Claims**

1. A resin composition for use in uncoated exterior materials markedly excellent in appearance and having high impact resistance and weather resistance wherein 10–70% by weight of graft copolymer (I) having a high rubber content, 90–30% by weight of a rigid thermoplastic resin (II) comprising 10–90% by weight of at least one aromatic vinyl monomer and

90–10% by weight of at least one ethylenic unsaturated monomer having the following general formula:

$$CH_2=CRX$$

wherein R represents hydrogen or CH_3 group and X represents CN or $COOR_1$ group (R_1 represents alkyl group having 1–8 carbon atoms), and 0–50% by weight of a diene rubber-containing thermoplastic resin (III) are blended together so that the total amount of components (I) through (III) is 100% by weight, said graft copolymer (I) having a high rubber content being obtained by polymerizing 50–10% by weight of a monomer mixture (c) comprising 10–90% by weight of at least one aromatic vinyl monomer and 90–10% by weight of at least one ethylenic monomer having the following general formula:

$$CH_2=CRX$$

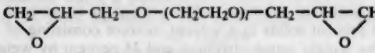
wherein R represents hydrogen or CH_3 group and X represents CN or $COOR_1$ group (R_1 represents alkyl group having 1–8 carbon atoms) in the presence of a latex of a crosslinked acrylic rubber having a multi-layer structure which contains, in its particle, 5–30% by weight of a rigid crosslinked resin (a) having a core particle diameter of 0.25–0.40μ and of which outer layer part is constructed of 45–85% by weight of a crosslinked acrylic ester type polymer (b) constituted mainly of an acrylic ester, so that the total amount of components (a) through (c) is 100% by weight.

4,351,922
PROCESS FOR THE PRODUCTION OF HIGHLY WATER-ABSORBING BUT LESS WATER-SOLUBLE HYDROGELS

Tooru Yoshida, Yokohama; Seigo Iwagami, Tokyo; Takashi Ueshima, and Yoshikazu Hosoda, both of Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1980, Ser. No. 179,609
Int. Cl.³ C08L *63/00*; C08F *20/20, 120/20*
U.S. Cl. 525—116 **20 Claims**

1. A process for producing a highly water-absorbing but less water-soluble hydrogel comprising polymerizing at least one hydrophilic ethylenically unsaturated monomer selected from the group consisting of a carboxylic acid containing an ethylenically unsaturated group, a sulfonic acid containing an ethylenically unsaturated group, and derivatives thereof to form a homopolymer or copolymer of said hydrophilic ethylenically unsaturated monomer, or a mixture of at least 50% of said hydrophilic ethylenically unsaturated monomer and less than 50% of an ethylenically unsaturated monomer copolymerizable therewith other than said hydrophilic ethylenically unsaturated monomer, in the presence of 0.005% to 20% by weight based on the total weight of the ethylenically unsaturated monomers of at least one difunctional compound selected from the group consisting of compounds represented by the formula (1):



(1)

wherein l is an integer of from 5 to 100.

4,351,923
PROCESS FOR TERPOLYMER POLYBLENDS HAVING HIGH GLOSS AND DUCTILITY

Edward F. Tokas, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 140,279, Apr. 14, 1980, Pat. No. 4,308,355. This application Dec. 4, 1980, Ser. No. 212,776
Int. Cl.³ C08F *4/34*
U.S. Cl. 525—250 **13 Claims**

1. A process for preparing terpolymer polyblends having high gloss and toughness comprising the steps:

A. charging an aqueous latex having polybutadiene rubber particles dispersed therein to a reaction zone,

B. mixing a monomer formulation of alkenyl aromatic, alkenyl nitrile and alkyl acrylate monomers with said latex, said alkyl acrylate monomer being present in an amount of about 1 to 20% by weight of said monomer formulation,

C. polymerizing by emulsifying on water said monomers in the presence of said latex such that, said rubber particles become grafted with at least a portion of said monomers while said monomers form a matrix terpolymer phase of said monomers,

D. separating said matrix terpolymer phase having said grafted rubber particles dispersed therein from said latex forming said terpolymer polyblend, wherein said polymerization in step (C) is carried out at 20° to 100° C., at 0.7 to 7 atms. of pressure with water soluble catalyst, said polybutadiene rubber particles having an average particle size of about 0.1 to 0.7 microns.

4,351,924
ω-, AND α,ω-HYDROXYHYDROCARBYL-(ALKYL METHACRYLATE) POLYMERS AND PROCESS

Gerald D. Andrews, Hockessin, and William H. Sharkey, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1981, Ser. No. 243,731
Int. Cl.³ C08F *120/18*
U.S. Cl. 525—330.6 **16 Claims**

1. A polymer consisting essentially of alkyl methacrylate polymers and copolymers having the formula:

$$(HO—R—CH_2C(C_6H_5)_2—(\text{Methacrylate ester})_x—)_mQ$$

wherein:

R is selected from alkylene of 1 to 20 carbons, cycloalkylene of 5 to 10 carbons, alkylenearylene of 7 to 32 carbons, arylene of 6 to 12 carbons, and alkylenearylenealkylene of 8 to 33 carbons;

"Methacrylate ester" represents combined units derived from one or more anionically polymerizable methacrylic acid esters in random or block copolymer segments, said esters having the formula $CH_2=C(CH_3)COOR'$, where R' is selected from:

(a) alkyl of 1 to 18 carbon atoms,
(b) alkenyl of 2 to 18 carbon atoms,
(c) alkadienyl of 5 to 18 carbon atoms,
(d) dialkylaminoalkyl of 4 to 12 carbon atoms,
(e) alkoxyalkyl of 3 to 12 carbon atoms,
(f) lower fluoroalkyl;

x is a number between 2 and 1000;

Q is selected from hydrogen, a carbon-carbon bond, an m-valent hydrocarbyl radical and a network polymer formed by polymerization of the methacrylate ester of a polyol;

m is 1 when Q is hydrogen, 2 when Q is a carbon-carbon bond, 1 to 6 when Q is a hydrocarbyl radical and more than 1 and up to 100 when Q is a network polymer.

4,351,925

PROCESS FOR THE THERMAL STABILIZATION OF ACRYLIC FIBERS AND FILMS

Steven B. Warner, Bernardsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 141,706, Apr. 18, 1980, Pat. No. 4,295,844. This application Apr. 27, 1981, Ser. No. 257,712

Int. Cl.³ C08F 8/32

U.S. Cl. 525—369 12 Claims

1. An improved process for the thermal stabilization of an acrylic film selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith comprising:

(a) contacting said film with a dilute solution of aniline and Group IA metal hydroxide which is provided at an elevated temperature for a residence time of approximately 5 to 30 minutes whereby said film is rendered capable of undergoing thermal stabilization on a more expeditious basis,

(b) removing the excess quantity of said solution adhering to said film following said contact, and

(c) heating said resulting film in an oxygen-containing atmosphere at a temperature of approximately 200° to 360° C. until a stabilized film is formed which is black in appearance, retains its original configuration substantially intact and which is non-burning when subjected to an ordinary match flame.

4,351,926

HEAT CURABLE POLYMER

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 26, 1979, Ser. No. 106,502

Int. Cl.³ C08F 8/42

U.S. Cl. 525—370 15 Claims

1. A process for making a heat-curable polymer comprising the steps of:

(a) preparing a mixture comprising:

alkylene-alkyl acrylate copolymer;

from 0.1 to 10 parts by weight based on 100 parts by weight of copolymer of difunctional compound having the formula

$$R_1—R_2—R_3$$

wherein R_1 and R_3 are independently selected from the group consisting of —OH, —SH,

$$—O—\overset{\overset{O}{\|}}{C}—R_4,$$

wherein R_4 is C_1 to C_{20} hydrocarbon; R_2 is a divalent organic radical terminated with other than aryl,

from 0.1 to 10 parts by weight based on 100 parts by weight of the copolymer of organo titanate;

(b) heating said mixture to temperature of between the melting temperature of the copolymer and about 200° C.

4,351,927

GLYCOLIZED POLYESTERS

Anthony W. McCollum; William L. Edmonson, both of Longview, Tex., and Stephen N. Belote, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1981, Ser. No. 259,410

Int. Cl.³ C08G 63/76

U.S. Cl. 525—437 6 Claims

1. Composition of matter comprising the reaction product of

(a) a polyester derived from an acid component comprising at least one of the acids terephthalic, isophthalic, and orthophthalic and a glycol component having from 2 to 24 carbon atoms, and

(b) 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate

said reaction product containing, by weight, about 40–80% of (a) and about 60–20% of (b) and having a hydroxyl number of about 150–300.

4,351,928

CURABLE HYDROXY FUNCTIONAL RESIN COMPOSITIONS CONTAINING REACTIVE DILUENTS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 187,932, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 62,604, Aug. 1, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,824

Int. Cl.³ C08L 67/02, 61/28

U.S. Cl. 525—443 14 Claims

1. A curable composition consisting essentially of:

(A) x parts by weight of a hydroxyl-bearing polymer selected from the group consisting of free hydroxyl-containing polyester, free hydroxyl-containing solid epoxy resins, and homo- and copolymers of vinyl alcohol, hydroxy alkylacrylates and α,β-unsaturated acids;

(B) from 0.10x to 0.60x parts by weight, which represents y-moles, of a liquid, hydroxyl- or amino-bearing aromatic diluent represented by the formula $R(Z)_b$ wherein R is an aromatic radical of valence b having at least one reactive ring position located ortho or para to a Z substituent, b is an integer from 1 to 3 and Z is a $—NH_2$ or —OH group substituted directly on an aromatic ring of R, said diluent having an atmospheric boiling point of about 150° C. or greater;

(C) an aminoplast resin containing unreacted methylol moieties or phenolic resole resin, capable of curing component (A) to a tack-free state, present in a quantity of from $(0.20x+z)$ to $(0.50x+2.5z)$ parts by weight, z being equal to y multiplied by the equivalent weight of said aminoplast or phenolic resole resin; and

(D) a catalytic amount of a catalyst which catalyzes the reaction between components (A) and (C).

4,351,929

CRYSTALLIZABLE CONTROLLED COMPOSITION INTERPOLYMERS OF VINYLIDENE CHLORIDE AND METHYL METHACRYLATE AND METHOD OF PREPARING SAME

Dale S. Gibbs, Midland, and Duane F. Foye, Merrill, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 126,637, Mar. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,201, Apr. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 902,313, May 3, 1978, abandoned. This application May 11, 1981, Ser. No. 262,265

Int. Cl.³ C08F 2/22, 214/08

U.S. Cl. 526—80 4 Claims

1. A process for preparing, in aqueous emulsion, a crystallizable, controlled composition interpolymer consisting essentially of (a) from about 88 to about 92 mole percent vinylidene chloride, (b) from about 8 to about 12 mole percent methyl methacrylate, and (c) up to about 3 weight percent, based on the combined weight of (a) and (b), of one or more ethylenically unsaturated comonomers; said interpolymer having a relative viscosity of at least about 1.40 at 25° C. as a 1 percent solution in tetrahydrofuran and being capable of forming substantially haze-free solutions when present in an amount of about 20 percent solids in a solvent mixture consisting of 65 percent by weight tetrahydrofuran and 35 percent by weight toluene as measured in terms of at least 85 percent transmission of the solution, after aging at 25° C. for a period of 24 hours,

against a reference of the pure solvent mixture using an ultraviolet spectrophotometer operating at a wavelength of 640 nm said interpolymer having a minimum heat-seal temperature no greater than 115° C., and having a water-vapor transmission rate of no greater than 0.25 g/100 in^2/24 hours when deposited as a coating from a tetrahydrofuran lacquer solution at a coating weight of 4 grams/$meter^2$; said process comprising the sequential steps of:

(1) polymerizing a primary monomer mixture consisting essentially of from about 88 to about 92 mole percent vinylidene chloride and from about 8 to about 12 mole percent methyl methacrylate in an aqueous polymerization medium containing an emulsifier, and a polymerization initiator; wherein

(A) from about 35 to about 45 percent of the primary monomer mixture is added to the aqueous medium at a rate sufficient to continuously provided an excess of unreacted monomer in the aqueous medium, and

(B) the remainder of the primary monomer mixture is added to the aqueous medium at a rate sufficient to continuously preclude the presence of an excess of unreacted monomer in the aqueous medium, and

(2) following the addition of substantially all of the primary monomer mixture, adding an end-shot comonomer to the polymerization medium in an amount and under conditions sufficient to control composition drift in the crystallizable interpolymer.

4,351,930
PROPYLENE COPOLYMERIZATION PROCESS AND PRODUCT

Birendra K. Patnaik, Parsippany, N.J., assignor to El Paso Polyolefins Company, Paramus, N.J.

Filed Feb. 5, 1981, Ser. No. 232,060
Int. Cl.³ C08F *210/06, 4/02*
U.S. Cl. 526—125 **15 Claims**

1. In a process for the production of a copolymer of propylene and ethylene wherein the polymerization of propylene and ethylene is conducted in the presence of a liquid diluent consisting essentially of propylene at pressures sufficient to maintain propylene in liquid phase and at temperatures between about 115° F. and about 165° F. in the presence of a catalyst composition containing the components

(a) an aluminum trialkyl at least partially complexed with an aromatic carboxylic acid ester electron donor and

(b) a complex of a titanium tri- or tetrahalide with an aromatic carboxylic acid ester electron donor supported on magnesium halide the components (a) and (b) being provided in a molar ratio of Al/Ti between about 10 and about 400, the method of increasing the polymerized ethylene content of the polymer without significantly affecting the isotactic index, which comprises: providing from about 1 to about 9 weight percent ethylene feed based on the weight of propylene feed; adding from about 1 to about 8 percent by weight of butene-1 based on the weight of propylene feed to the polymerization zone, and recovering a polymer product having a propylene content of from about 80 to about 96.5 weight percent, and ethylene content of from about 3 to about 17 weight percent and a butene-1 content of from about 0.5 to about 5 weight percent.

4,351,931
POLYETHYLENE COPOLYMERS

John B. Armitage, Sharpley, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 349,759, Mar. 5, 1964, abandoned, which is a continuation-in-part of Ser. No. 119,265, Jun. 26, 1961, abandoned. This application Jul. 19, 1971, Ser. No. 164,074
Int. Cl.³ C08F *2/02, 220/06*
U.S. Cl. 526—227 **31 Claims**

1. A uniformly random, homogeneous copolymer of ethylene and an α,β-ethylenically unsaturated acid selected from the class consisting of acrylic acid and methacrylic acid, said copolymer exhibiting improved adhesion to solid metallic substrates and being composed of at least about 90% by weight ethylene and having at least 0.45% by weight of said unsaturated acid copolymerized therewith and uniformly randomly distributed along the copolymer chains, and said copolymer having a melt index of 0.01 to 30 g/10 min.

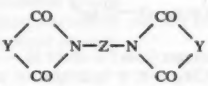
4,351,932
BIS-MALEIMIDE/DIVINYL ARYL CROSSLINKING AGENT RESIN SYSTEM

Sidney W. Street, Hacienda Heights, and Don A. Beckley, Newport Beach, both of Calif., assignors to Hitco, Irvine, Calif.

Filed Mar. 27, 1980, Ser. No. 134,666
Int. Cl.³ C08F *22/40*
U.S. Cl. 526—262 **9 Claims**

1. A resin system essentially of:

50 to 95 percent by weight of a mixture of unsaturated N,N'-bis-imides of the formula:



where Y represents a divalent radical of at least 2 carbon atoms and contains a carbon-carbon double bond and in the major portion of the mixture, Z is the residue of at least one aromatic diamine and in the minor portion of the mixture Z is the residue of an aliphatic diamine;

5 to 35 percent by weight of a divinyl-aryl, cross-linking agent capable of addition polymerization cross-linking with the bis-imides at a temperature from above 100 degrees F. to 250 degrees F.;

0 to 15 percent by weight of compatible elastomers that are compatible with the bis-imide and cross-linking agent;

0 to 10 percent by weight of a trifunctional unsaturated curing agent for said bis-imide; and

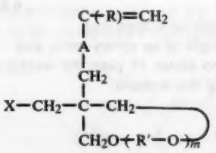
0 to 5 percent by weight of an oxidation inhibitor.

4,351,933
VINYL SUBSTITUTED CYCLIC POLYETHERS AND ADDITION POLYMERS THEREOF

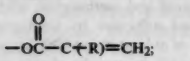
Thomas A. Chamberlin, and Donald A. Tomalia, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 107,813, Dec. 28, 1979, which is a division of Ser. No. 961,159, Nov. 16, 1978, Pat. No. 4,256,855, which is a division of Ser. No. 751,870, Dec. 17, 1976, Pat. No. 4,139,539, which is a continuation-in-part of Ser. No. 517,703, Oct. 24, 1974, abandoned. This application Jun. 8, 1981, Ser. No. 271,745
Int. Cl.³ C08F *20/22, 20/26*
U.S. Cl. 526—266 **11 Claims**

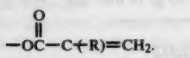
1. An addition polymer of the compound represented by the formula:



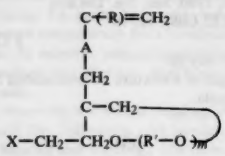
wherein m is an integer from 2 to about 10, —X is —Cl, —OR'' or —AC-(-R)=CH_2; —R is hydrogen or methyl; —R'— is ethylene, 1,2-propylene or 1,3-propylene; —R'' is hydrogen or lower hydrocarbyl; and —AC-(-R)=CH_2 is —O—C-(-R)=CH_2 or



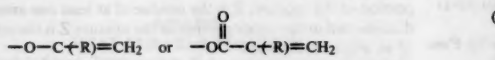
provided that when —X is —Cl, —AC(—R)=CH_2 is



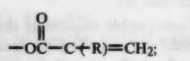
11. A cross-linked, water-insoluble addition polymer of the compound represented by the formula:



wherein m is an integer from 2 to about 10, —X is —Cl, —OR″ or —AC(—R)=CH_2; —R is hydrogen or methyl; —R′— is ethylene, 1,2-propylene or 1,3-propylene; —R″ is hydrogen or lower hydrocarbyl; and —AC(—R)=CH_2 is



provided that when —X is —Cl, —AC(—R)=CH_2 is



and further characterized in that when the cross-linked water-insoluble addition polymer is a homopolymer of the compound or a copolymer of the compound with a comonomer of mono-ethylene functionality, then —X is —AC(—R)=CH_2; and when the cross-linked, water-insoluble addition polymer is a copolymer of the compound with a comonomer of multiple ethylene functionality then —X is —Cl, —OR″ or —AC(—R)=CH_2.

4,351,934

EPOXY RESIN COMPOSITIONS

Edward W. Kluger, Pauline, and Calvin D. Welch, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 2, 1981, Ser. No. 230,722

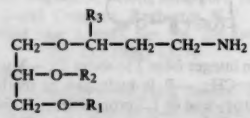
Int. Cl.[3] **C08G** *59/50, 59/64*

U.S. Cl. 528—111 **6 Claims**

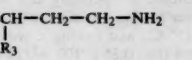
1. An epoxy resin composition comprising:

a. about 100 parts by weight of an epoxy resin; and

b. from about 15 parts to about 35 parts by weight of an aminoalkoxypropane of the formula:



where R_1 and R_2 are independently selected from H and



where R_3 is selected from H and a lower alkyl group having from 1 to about 4 carbon atoms.

4,351,935

THERMOSETTING COATING COMPOSITION CONTAINING A BLOCKED ACID CATALYST

Johan B. Reesink, Didam; Hendrik J. Hageman, Rozendaal, and Ulfert E. Wiersum, Velp, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

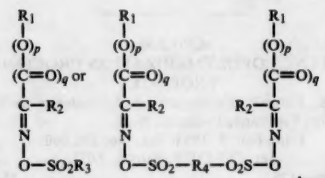
Filed Jul. 14, 1981, Ser. No. 283,332

Claims priority, application Netherlands, Jul. 14, 1980, 8004031

Int. Cl.[3] **C08G** *12/12, 12/32;* **C08L** *61/32*

U.S. Cl. 528—242 **10 Claims**

1. A thermosetting coating composition containing an acid-curable amino resin and an amount of a blocked acid corresponding to 0.1 to 10 percent by weight, calculated on the amino resin of potentially available sulphonic acid, said blocked acid having one of the following formulae:



wherein,

p=O or 1 and q=O or 1, and

R_1 is a substituted or unsubstituted alkyl group, alkenyl group, cycloalkyl group, cycloalkenyl group, aryl group, aralkyl group, aralkenyl group or heterocyclic group having not more than 20 carbon atoms;

R_2 is the same as R_1, NH_2, CN, an alkoxy carbonyl group, cycloalkoxy carbonyl group, aroxy carbonyl group or acyl group having not more than 20 carbon atoms, or the two groups R_1 and R_2 form part of a cyclic or heterocyclic group having not more than 12 atoms in the ring;

R_3 is an alkyl group, alkenyl group, cycloalkyl group, cycloalkenyl group, aryl group or heterocyclic group having not more than 30 carbon atoms and

R_4 is an alkylene group, alkenylene group, cycloalkylene group, cycloalkenylene group, arylene group or bifunctional heterocyclic group having not more than 35 carbon atoms.

4,351,936

METHOD FOR REDUCING THE TERMINAL CARBOXYL GROUP CONTENT OF A SATURATED POLYESTER, A SATURATED POLYESTER HAVING A REDUCED TERMINAL CARBOXYL GROUP CONTENT, AND A MOLDED ARTICLE COMPOSED OF SUCH A SATURATED POLYESTER

Shunichi Matsumura, Hachioji; Hiroo Inata, Hino, and Tsuto Morinaga, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,051

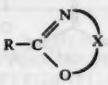
Claims priority, application Japan, Dec. 5, 1979, 54-156893; Apr. 21, 1980, 55-51784; Jun. 18, 1980, 55-81305

Int. Cl.[3] **C08G** *63/44, 73/16*

U.S. Cl. 528—289 **22 Claims**

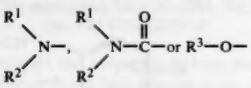
1. A process for producing a saturated polyester having a reduced terminal carboxyl group content, which comprises reacting a carboxyl-terminated, substantially linear, fiber-form-

ing saturated polyester with a monocyclic imino ether compound of the formula



(I)

wherein R is a group of the following formula



in which R^1 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an alkenyl group having 3 to 10 carbon atoms, a cycloalkenyl group having 5 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms or an aralkyl group having 7 to 20 carbon atoms, and R^2 is any one of the above groups for R^1 with the exception of the hydrogen atom, and R^3 is an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an alkenyl group having 3 to 10 carbon atoms, a cycoalkenyl group having 5 to 12 carbon atoms, or an aralkyl group having 7 to 20 carbon atoms, and R^1 and R^2 may be bonded to each other, to form together with the nitrogen atom a 5- or 6-membered ring which is non-reactive with the saturated polyester under the reaction conditions; and X is a divalent organic group non-reactive with the saturated polyester under the reaction conditions, which has two or three ring-member carbon atoms constituting the imino ether ring.

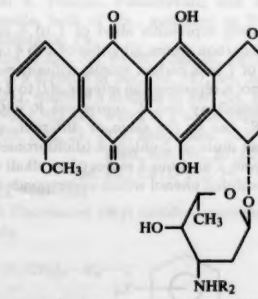
4,351,937

N-GLYCOSYL DERIVATIVES OF ANTHRACYCLINE ANTIBIOTICS AND THE METHOD OF THEIR PREPARATION

Barbara J. Stefanska, Gdansk-Oliwa; Leonard S. Falkowski, Gdansk, and Edward Borowski, Gdansk-Wrzeszcz, all of Poland, assignors to Politechnika Gdanska, Majakowskiego, Poland

Filed Jul. 25, 1980, Ser. No. 172,262
Claims priority, application Poland, Oct. 17, 1979, 219049
Int. Cl.³ C07H *15/24*
U.S. Cl. 536—6.4 **3 Claims**

1. Anthracycline antibiotics selected from the group consisting of daunorubicin and adriamycin, of the formula



I

where R_1 is hydrogen or a hydroxyl group and where R_2 is selected from the group consisting of ribose, glucose, fructose residues and the glucuronamide residues formed with N-octylamide, N-butylamide and the methyl ester of glucuronic acid.

4,351,938

ANTICOAGULANT SUBSTANCE

William E. Barnett, Clearwater, Fla., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed May 19, 1980, Ser. No. 151,163
Int. Cl.³ C08B *37/10*; A61K *31/725*
U.S. Cl. 536—21 **7 Claims**

1. A process which comprises reacting a heparin salt with from about 5 to 100 milliliters of an aqueous nitrous acid solution per gram of the heparin salt, the aqueous solution containing from about 5 to 80 milligrams of nitrous acid per gram of the heparin salt under controlled conditions of temperature in the range of about 0° C. to 30° C. and pH in the range of from about 1.5 to 4 until the heparin has partially depolymerized to a product which has

(1) a weight average molecular weight of from about 2,000 to 7,000 daltons, when determined by HPLC using 1.5 molar aqueous sodium chloride as the mobile phase and dextrans as the standard,

(2) a polydispersity (D) of less than about 2.5, and

(3) analyzable reducing end groups of which the majority are anhydromannose groups,

terminating the depolymerization reaction and recovering the partially depolymerized product.

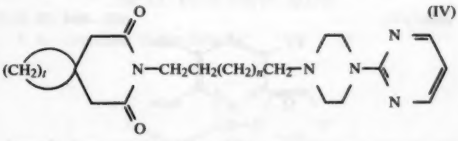
4,351,939

SPIRO-QUATERNARY AMMONIUM HALIDES AND N-(2-PYRIMIDINYL)PIPERAZINYLALKYLAZASPIROALKANEDIONE PROCESS

Jack C. Simms, deceased, late of Elberfeld, Ind., and Old National Bank in Evansville, administrator, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

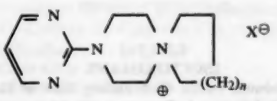
Filed Oct. 16, 1980, Ser. No. 197,416
Int. Cl.³ C07D *401/14, 487/10, 471/10*
U.S. Cl. 544—230 **4 Claims**

1. A process for the preparation of an N-(2-pyrimidinyl)-piperazinylalkylazaspiroalkanedione of Formula IV



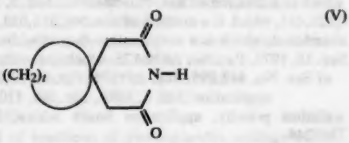
(IV)

wherein n is equal to 1 or 2 and t is equal to 4 or 5 which comprises condensing a spiro-quaternary ammonium halide compound of formula I



(I)

wherein n is equal to 1 or 2 and X is chlorine, bromine, or iodine with a spiro-substituted glutarimide of Formula V



(V)

wherein t is 4 or 5 in a liquid reaction medium in the presence of a strong base.

4,351,940
CHLORO- AND ALKOXY-SUBSTITUTED-2-CHLORO-4-AMINOD-QUINAZOLINES

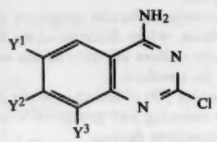
Hans-Jurgen E. Hess, Old Lyme; Jasjit S. Bindra, and Praful K. Shah, both of Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 126,838, Mar. 3, 1980, Pat. No. 4,287,341, which is a continuation-in-part of Ser. No. 90,313, Nov. 1, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,236

Int. Cl.³ C07D *239/95*

U.S. Cl. 544—293 3 Claims

1. A compound of the formula



wherein Y^1 is chloro, Y^2 is OR and Y^3 is hydrogen or OR where R is alkyl having from 1 to 3 carbon atoms.

4,351,941
PYRIDINYL-PYRIDINES

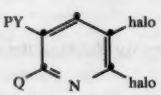
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 231,312, Feb. 4, 1981, Pat. No. 4,331,672, which is a continuation-in-part of Ser. No. 135,100, Mar. 28, 1980, Pat. No. 4,297,360. This application Nov. 2, 1981, Ser. No. 317,548

Int. Cl.³ C07D *401/04*

U.S. Cl. 546—258 4 Claims

1. A 2,3-dihalo-5-PY-6-Q-pyridine having the formula



or pharmaceutically-acceptable acid-addition salt thereof, where halo is chloro or bromo, PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and Q is hydrogen or lower-alkyl.

4,351,942
ISOCHROMANS

Thomas A. Dobson; Leslie G. Humber, both of Dollard des Ormeaux; Christopher A. Demerson, St. Laurent, and Ivo L. Jirkovsky, Montreal, all of Canada, assignors to American Home Products Corp., New York, N.Y.

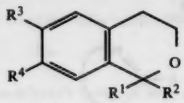
Division of Ser. No. 765,169, Feb. 3, 1977, Pat. No. 4,223,151, which is a division of Ser. No. 584,086, Jun. 5, 1975, Pat. No. 4,021,451, which is a division of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sep. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, Jun. 1, 1971, Pat. No. 3,843,681. This application Jan. 7, 1980, Ser. No. 110,430

Claims priority, application South Africa, Sep. 15, 1972, 72/3344

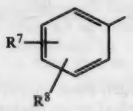
Int. Cl.³ C07D *311/76, 405/04, 409/04*

U.S. Cl. 546—269 8 Claims

1. A compound of formula 1



wherein R^3 and R^4 each are hydrogen, hydroxyl or lower alkoxy; R^1 is hydrogen, or lower alkyl; and R^2 is 2-thienyl, 2-pyridyl, 3-pyridyl or



wherein R^7 and R^8 are the same or different and each represent hydrogen, halo, or hydroxyl with the proviso that when R^7 and R^8 are hydrogen, then R^3 and R^4 are hydroxyl, and when R^7 or R^8 is halo then R^3 and R^4 is hydroxyl or lower alkoxy.

4,351,943
PRODUCTION OF 6-(CHLORO OR SUBSTITUTED PHENOXY)-2-DI-(SUBSTITUTED PHENOXY)METHYL PYRIDINES

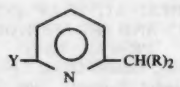
Sudarshan K. Malhotra, Walnut Creek, Calif., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 266,016, Sep. 18, 1980, Pat. No. 4,324,896. This application Oct. 30, 1981, Ser. No. 316,608

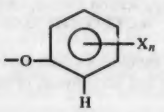
Int. Cl.³ C07D *213/51*

U.S. Cl. 546—301 19 Claims

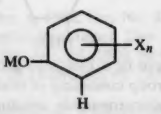
1. A process for the preparation of compounds corresponding to the formula



wherein Y represents chloro or R′; R represents



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkyl sulfonyl of 1 to 4 carbon atoms, trifluoromethyl, chloro, fluoro or bromo; n represents an integer of 0 to 2 or X_n represents 3,4-methylenedioxy and R′ represents R with the proviso that R and R′ can be the same or different, which comprises reacting one mole of 2-chloro-6-(dichloromethyl)-pyridine with from about 1 to about 3 moles of an alkali metal salt of at least one substituted phenol which corresponds to the formula



wherein M represents sodium, potassium, lithium or cesium at

a temperature of from about 100° to about 200° C. and in the presence of a solvent and recovering the desired product therefrom.

4,351,944

IMPROVED PROCESS FOR PREPARING 3-(4-PYRIDINYL)ANILINE

Rudolf Oesterlin, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 103,191, Dec. 13, 1979, abandoned. This application May 26, 1981, Ser. No. 266,667

Int. Cl.³ C07D *213/38*

U.S. Cl. 546—329 **5 Claims**

1. In the process for preparing 3-(4-pyridinyl)aniline by acetylating 3-(4-pyridinyl)-2-cyclohexen-1-one oxime to produce the corresponding O-acetyl oxime, and heating the latter under acidic conditions to produce N-acetyl-3-(4-pyridinyl-)aniline and hydrolyzing the N-acetyl compound, the improvement which comprises heating 3-(4-pyridinyl)-2-cyclohexen-1-one oxime with an excess each of acetic anhydride and anhydrous phosphoric acid, distilling off the acetic acid by-product and excess acetic anhydride, adjusting the pH of the reaction mixture to about 5 to 9 with concentrated aqueous alkali, extracting N-acetyl-3-(4-pyridinyl)aniline from the concentrated aqueous phosphate salt solution with a lower-alkanol, and hydrolyzing the N-acetyl-3-(4-pyridinyl)aniline.

4,351,945

TWO-PHASE PROCESS FOR THE PREPARATION OF AZOLE AND AZOLINE DISULFIDES

Stanley J. Brois, Wantage, England, and Antonio Gutierrez, Hamilton Square, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 970,230, Dec. 18, 1978, Pat. No. 4,286,096, which is a division of Ser. No. 771,183, Feb. 23, 1977, Pat. No. 4,155,910, which is a division of Ser. No. 555,375, Mar. 5, 1975, Pat. No. 4,039,552. This application Feb. 5, 1979, Ser. No. 9,741

Int. Cl.³ C07D *235/28, 263/58, 285/08*

U.S. Cl. 548—130 **13 Claims**

1. A process for preparing a polysulfide of a thiol-substituted azole or azoline comprising the step of halogen-induced oxidative coupling of a 2-mercapto azole or azoline or the alkali or alkaline earth metal salt thereof with a hydrocarbon substituted C_2–C_{100} polysulfide reactant in a two-phase liquid reaction medium comprising a non-polar organic solvent phase and an aqueous phase.

4,351,946

FLUORINATED HETEROCYCLIC SULFIDES

Sameeh S. Toukan, Phoenixville, and Murray Hauptschein, Glenside, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 61,567, Jul. 30, 1979, Pat. No. 4,254,266, which is a division of Ser. No. 587,794, Jun. 17, 1975, Pat. No. 4,177,351, which is a division of Ser. No. 396,649, Sep. 12, 1973, Pat. No. 3,933,819, which is a continuation-in-part of Ser. No. 171,325, Aug. 21, 1971, abandoned. This application Nov. 14, 1980, Ser. No. 207,037

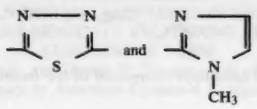
Int. Cl.³ C07D *233/54, 285/12*

U.S. Cl. 548—142 **7 Claims**

1. A fluorinated alkyl sulfide compound represented by the formula:

$$[R_f(CH_2)_n—S]_z—Q$$

where R_f is selected from the group consisting of perfluoroalkyl, perfluoroisoalkoxyalkyl and perfluoromonochloroalkyl radicals having from 5 to 13 carbon atoms, n is an integer of 2 or 3, z is 1 or 2, and Q is selected from the group consisting of the following:



4,351,947

TETRAZOLE DERIVATIVE

Chisei Shibuya, Fuji; Masahiro Murakami, Nobeoka; Masateru Kobayashi, Nobeoka, and Takanori Sone, Nobeoka, all of Japan, assignors to Asahi Chemical Industry Co., Ltd., Japan

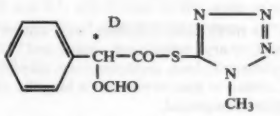
Filed Feb. 20, 1981, Ser. No. 236,542

Claims priority, application Japan, Mar. 6, 1980, 55-27303; Mar. 7, 1980, 55-28043

Int. Cl.³ C07D *544/036*

U.S. Cl. 548—251 **2 Claims**

1. A tetrazole-5-thiol ester having D-configuration of the formula:



(I)

4,351,948

IMIDAZOLE HYDRAZONE DERIVATIVES

Peter J. Fellner, Marlow, England; Brendan J. Hamill, Livingston, Scotland, and Paul W. Manley, High Wycombe, England, assignors to G.D. Searle & Co., Skokie, Ill.

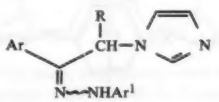
Filed Jan. 16, 1981, Ser. No. 225,583

Claims priority, application United Kingdom, Jan. 25, 1980, 8002577

Int. Cl.³ C07D *409/06, 233/61*

U.S. Cl. 548—336 **17 Claims**

1. A compound of the formula



or a pharmacologically acceptable salt thereof wherein:

Ar is phenyl, thienyl or a mono, di or trisubstituted form thereof wherein the mono, di or trisubstituent is F, Cl, Br, CF_3, C_1–C_3alkyl, C_1–C_3alkoxy, CN, or NO_2;

Ar^1 is $C_6H_{5-n}X_n$;

X is F, Cl or CF_3;

R is H, CH_3 or CH_2CH_3; and

n is an integer from 1 to 5.

4,351,949

BICYCLIC PROSTAGLANDIN ANALOGS AND METHOD OF SYNTHESIS

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

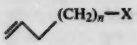
Filed Feb. 5, 1981, Ser. No. 231,596

Int. Cl.³ C07C *177/00*

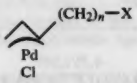
U.S. Cl. 548—359 **7 Claims**

1. A method of synthesis of prostaglandin analogs by the addition of pi-allyl-palladium compounds to bicyclic alkenes, said method comprising:

converting a terminal olefin of the formula:



to a pi-allyl-palladium compound of the formula



wherein "n" equals a whole integer of from 0 to 7 and "X" is carboxylic acid, or C_1–C_8 ester, alcohol, ether or amide groups;

adding said pi-allyl-palladium compound to a bicyclic olefin of the formula

wherein "A" is methylene, ethylene, oxy, imino, or lower alkyl, phenyl, or aryl, substituted amino; and "D" is methylene, ethylene, vinylene, methyleneoxy, alkylidenedioxy, iminooxy, dithio or azo, to provide a bicyclic alkyl palladium addition compound,

displacing the palladium moiety of said addition compound with an acetylene or vinyl moiety, and

removing the protecting groups, if any exist, from the acetylene or vinyl moiety, to provide a prostaglandin analog.

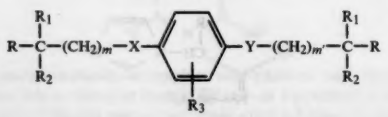
4,351,950

ANTI-ARTERIOSCLEROTIC AGENTS

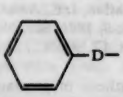
Ila Sircar, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 2, 1980, Ser. No. 108,978
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—62 **32 Claims**

1. A compound having the structural formula:



wherein X and Y are the same or different and are oxygen, sulfur, sulfone or sulfoxide; m and m′ are the same or different and are integers chosen from 2–5; R is CH_2OH; CHO; CO_2A wherein A is hydrogen, alkyl of from 1 to 6 carbon atoms, an alkali or alkaline earth metal cation, an organic amine cation or ammonium; R_1 and R_2 are the same or different and are alkyl of from 1 to 6 carbon atoms, or when taken together are $-(CH_2)-_{3-5}$; and R_3 is hydrogen, halo, alkyl of from 1 to 6 carbon atoms, methoxy, phenyl, trifluoromethyl, 2,5-dichloro, 2,5-dimethyl, 2,3,5-trimethyl, carboxylic acyl of from 1 to 6 carbon atoms, alpha-hydroxyalkyl of from 1 to 6 carbon atoms, 2-chlorophenyl, 4-chlorophenyl, 2,4-dichlorophenyl, 4-methoxyphenyl, 2-tolyl, 4-tolyl or



wherein D is O,CO,S,SO,SO_2,CH_2, or CHOH; provided that R_3 may not be hydrogen when X and Y are oxygen, m and m′ are 2; R_1 and R_2 are CH_3, and R is CO_2H; and further provided that R_3 may not be halo when X and Y are both sulfur; and when R is COOH, the pharmaceutically acceptable salts thereof.

4,351,951

PROCESS FOR MAKING GLYOXYLATE HEMIACETALS

Manuel M. Baizer, Santa Monica, Calif., and Richard D. Goodin, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 972,170, Dec. 21, 1978. This application Sep. 8, 1980, Ser. No. 184,868
Int. Cl.³ C07C *67/36*
U.S. Cl. 560—186 **12 Claims**

1. A process for making glyoxylate hemiacetals comprising reacting an alcohol of the formula ROH where R is alkyl or reacting formate ester of the formula

where R is alkyl with CO under pressure in the presence of a basic iniator of the formula $M^+(OR)^-$ where M is an alkali metal and R is alkyl, and in the presence of a complexing agent for M^+ selected from ethers and polyamines and having O and/or N donor atoms capable of solvating M^+, or in the presence of a basic initiator of the formula $NR''_4{}^+(OR)^-$ where each R″ is the same or a different alkyl or aralkyl and R is alkyl.

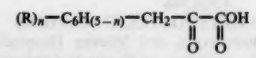
4,351,952

PROCESS FOR PREPARING PHENYL PYRUVIC ACIDS

Marco Foa, Novara; Alessandro Moro, Pernate; Andrea Gardano, Trino Vercellese, and Luigi Cassar, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

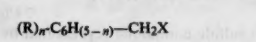
Filed Jul. 1, 1980, Ser. No. 165,019
Int. Cl.³ C07C *51/10*
U.S. Cl. 562—406 **11 Claims**

1. A process for preparing phenyl pyruvic acids having the formula (I):



(I)

in which n is an integer selected from 1, 2 and 3 and substituent or substituents R, which may be the same or different, are hydrogen, alkyls or alkoxy groups having 1 to 4 carbon atoms, alkyl or alkoxy groups substituted by alkoxy groups having 1 to 4 carbon atoms, halogens, nitrile groups, or acyl groups, by carbonylation with CO of benzyl halides having the formula (II):



(II)

wherein n and R have the same meanings as in formula (I) and X is a halogen selected from chlorine and bromine, in the presence of carbonyl complexes of cobalt and of an inorganic basic agent, characterized in that the carbonylation reaction is conducted in an aqueous-organic medium consisting of a water-mixable ether solvent, at a pressure raging from about 5 to about 60 atmospheres and at a temperature ranging from about 50° to about 90° C.

4,351,953

PREPARATION OF CARBOXYLIC ACIDS BY CARBONYLATION OF ALCOHOLS

Jean Gauthier-Lafaye, Lyon, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 26, 1981, Ser. No. 247,744
Claims priority, application France, Apr. 2, 1980, 80 07876
Int. Cl.³ C07C *51/12, 53/08, 53/134, 57/30*
U.S. Cl. 562—519 22 Claims

1. A process for the preparation of a carboxylic acid having the structural formula R^1COOH, wherein R^1 is a linear, branched or cyclic chain alkyl radical of from 1 to 6 carbon atoms or a $\Phi-C_nH_{2n}-$ radical wherein Φ is phenyl and $1 \leqq n \leqq 6$, comprising carbonylating an alcohol having the formula $R^1—OH$ with carbon monoxide in liquid phase, in the presence of a catalytically effective amount of nickel and an alkyl or acyl halide promoter therefor, wherein said acyl halide is of the formula

in which X represents a chlorine, bromine or iodine atom and R^3 is defined as was R^1 above, and further wherein R^3 and R^1 may be the same or different, and under a total pressure of less than 200 bars, said carbonylation being carried out in the presence of at least one chromium salt in which the chromium is in an oxidation state (p) of greater than zero ($p>0$), and in an initial carboxylic acid reaction medium having the formula $R^2—COOH$, wherein R^2 is defined as was R^1 above, and further wherein R^1 and R^2 may be the same or different.

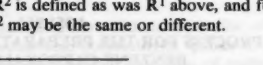
4,351,954

HALOGENATED α-AMINO ACIDS

Hiroshige Muramatsu, and Teruo Ueda, both of Nagoya, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Continuation-in-part of Ser. No. 192,808, Oct. 1, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,183
Claims priority, application Japan, Oct. 13, 1979, 54-132017
Int. Cl.³ C07C *101/10*
U.S. Cl. 562—574 1 Claim

1. A halogenated α-amino acid represented by the general formula:



wherein, X is one member selected from the group consisting of Cl and Br, X' is one member selected from the group consisting of F, Cl and H, and R is one member selected from the group consisting of H and CH_3.

4,351,955

ALPHA-HYDROXYISOBUTYRIC ACID PROCESS

Carl L. Willis, and Lynn H. Slaugh, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 5, 1980, Ser. No. 204,676
Int. Cl.³ C07C *59/00*
U.S. Cl. 562—579 5 Claims

1. A process for producing alpha-hydroxyisobutyric acid which comprises reacting acetone cyanohydrin with alpha-hydroxymethanesulfonic acid and water at a temperature ranging from about 70° C. to about 125° C.

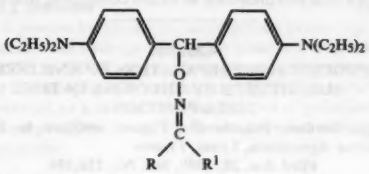
4,351,956

OXIME ETHERS OF 4,4'-BIS(N,N-DIETHYLAMINO)BENZHYDROL AND PRESSURE-SENSITIVE RECORDING SYSTEMS CONTAINING THEM

Frank F. Cesark, and Daniel W. Thomas, both of Bridgewater, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 31, 1981, Ser. No. 297,802
Int. Cl.³ C07C *131/00*
U.S. Cl. 564—256 2 Claims

1. The compounds represented by the formula:



wherein R and R^1, which may be the same or different, represent an alkyl group of 1 to 4 carbon atoms.

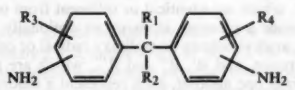
4,351,957

PROCESS FOR PREPARING DIAMINODIPHENYL-ALKANES

Kwok K. Sun, Hamden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 29, 1979, Ser. No. 53,378
Int. Cl.³ C07C *87/50*
U.S. Cl. 564—331 13 Claims

1. A process for the preparation of a bis(aminophenyl)alkane having the formula:

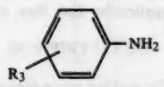


wherein R_1 and R_2, taken individually, each represent lower-alkyl, R_1 and R_2 taken together with the C atom to which they are attached represent the residue of a 1,1-cycloalkylidene group having from 5 to 7 ring carbon atoms, inclusive, and R_3 and R_4 are independently selected from the group consisting of hydrogen, lower-alkyl, lower-alkenyl and lower-alkoxy;

which process comprises the steps of

(a) reacting a m-lower-alkylphenol with a ketone selected from the class consisting of lower-alkanones and cycloalkanones containing from 5 to 7 ring carbon atoms in the proportion of at least 1 mole of m-lower-alkylphenol per mole of ketone and in the presence of an acid catalyst and

(b) heating the resulting product at a temperature of 50° C. to 300° C. with at least 2 moles, per mole of said product, of an acid addition salt of at least one aromatic amine having the formula:



wherein R_3 has the meaning set forth above.

4,351,958
PROCESS FOR PRODUCING ORTHOALKYLATED AROMATIC AMINE

Kazunori Takahata, Otake, and Katsuo Taniguchi, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,166
Int. Cl.³ C07C *85/24*
U.S. Cl. 564—409 **7 Claims**

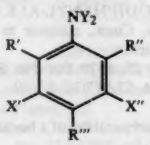
1. A process for producing an orthoalkylated aromatic amine comprising the step of reacting (a) an aromatic amine having at least one hydrogen atom at the ortho-positions and (b) a primary or secondary alcohol under heating in the presence of a catalyst containing, as a main constituent, iron oxides.

4,351,959
PROCESS FOR PREPARATION OF ANILINES SUBSTITUTED BY CHLORINE IN THE META-POSITION

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jan. 28, 1980, Ser. No. 116,154
Claims priority, application France, Feb. 15, 1979, 79 04481
Int. Cl.³ C07C *85/24*
U.S. Cl. 564—412 **19 Claims**

1. A process for the preparation of anilines substituted in the meta-position by chlorine, by the catalytic hydrogenation of chlorine-substituted nitrogen-containing benzene derivatives, in the liquid phase, in an acid medium, under the action of heat, under pressure and in the presence of noble metals from group VIII of the periodic classification, in which process the benzene derivatives have the formula:



(I)

in which Y represents the hydrogen atom or the oxygen atom, X' and X'', which are identical or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical or one of X' and X'' in hydrogen, and R', R'' and R''', which are identical or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aralkyl, alkoxy or aryloxy radical, at least one of these three representing the chlorine atom and at most two of R', R'' and R''' being hydrogen, and the reaction is carried out in an aqueous medium in which the pH is less than 1.5 and/or the concentration of H^+ ions in the aqueous reaction medium is between 0.5 and 12 g.ions/liter, in the presence of iodide and/or bromide ions and in which the proportion of iodide ions in the reaction medium is at least 10^{-6} g.ions/liter and/or the proportion of bromide ions in the reaction medium is at least 0.01 g.ion/liter.

4,351,960
PRODUCTION OF AN ISOMERIC MIXTURE OF SECONDARY PHOSPHINES

Georg Elsner, Hürth; Hartfrid Vollmer, and Gero Heymer, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,448
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939588
Int. Cl.³ C07F *9/50*
U.S. Cl. 568—8 **4 Claims**

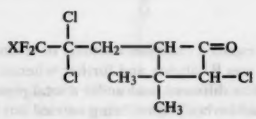
1. In the process for making secondary phosphines by reacting under reaction conditions of pressure hydrogenphosphide with dicyclopentadiene in the presence of a catalyst, the improvement which comprises: reacting the hydrogen phosphide with the dicyclopentadiene in a molar ratio of 1:at least 2 and in the presence of azo-bis-isobutyronitrile or di-t-butylperoxide as catalyst, with the resulting formation of a mixture consisting essentially of isomeric secondary phosphines having the summation formula $C_{20}H_{27}P$.

4,351,961
2-(2',2'-DICHLORO-3',3',3'-TRIFLUOROPROPYL)- AND 2-(2',2',3'-TRICHLORO-3',3'-DIFLUOROPROPYL)-4-CHLOROCYCLOBUTAN-1-ONES

Pierre Martin, Rheinfelden; Eginhard Steiner, Füllinsdorf, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 28, 1980, Ser. No. 210,892
Claims priority, application Switzerland, Dec. 7, 1979, 10869/79
Int. Cl.³ C07C *49/457*
U.S. Cl. 568—381 **2 Claims**

1. A compound of the formula I



(I)

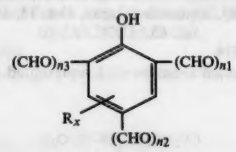
wherein X is chlorine or fluorine.

4,351,962
PROCESS FOR THE PREPARATION OF HYDROXY BENZENE CARBOXALDEHYDES

Peter S. Gradeff, Pottersville, and Stanley T. Murayama, Princeton, both of N.J., assignors to Rhone Poulenc Inc., Monmouth Junction, N.J.

Filed Jul. 11, 1980, Ser. No. 168,940
Int. Cl.³ C07C *45/36, 45/00*
U.S. Cl. 568—432 **28 Claims**

1. A process for the preparation of hydroxy benzene carboxaldehydes having the formula:



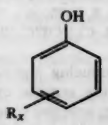
wherein:

R is selected from the group consisting of alkyl, alkoxy, cycloalkyl, aryl, alkoxyalkyl, fluoroalkyl, and hydroxyalkyl oxyalkylene having from one to about twenty carbon atoms; hydroxyalkyl having at least two to about twenty carbon atoms; hydroxy; aldehyde CHO; and halogen;

n_1, n_2 and n_3 are zero or 1; and at least one of n_1, n_2 and n_3 is 1; and

x is zero, 1, 2, 3, or 4, which comprises:

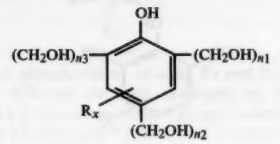
(1) condensing with a formaldehyde compound a phenol having the formula:



wherein

R is selected from the group consisting of alkyl, alkoxy, hydroxyalkyl, cycloalkyl, aryl, alkoxyalkyl, fluoroalkyl, and hydroxyalkyl oxyalkylene having from one to about twenty carbon atoms; hydroxy; and halogen; and

x is zero, 1, 2, 3 or 4, and unsubstituted in at least one ortho or para position in an aqueous reaction medium comprising phenol:HCHO in a molar ratio within the range from about 1:0.1 to about 1:3 and alkali in a molar ratio alkali:phenol within the range from about 1:0.1 to about 1:2 and an alkali concentration not exceeding 30% by weight at a temperature within the range from about 0° to about 120° C. and obtaining a reaction mixture comprising a mixture of monomethylol and polymethylol phenols having the formula:



wherein

R is selected from the group consisting of alkyl, alkoxy, hydroxyalkyl, cycloalkyl, aryl, alkoxyalkyl, fluoroalkyl, and hydroxyalkyl oxyalkylene having from one to about twenty carbon atoms; hydroxy; and halogen;

n_1, n_2 and n_3 are zero or 1; and at least one of n_1, n_2 and n_3 is 1; and

x is zero, 1, 2, 3 or 4;

(2) subjecting the reaction mixture without separation of the monomethylol species from polymethylol species to oxidation under conditions favoring oxidation of methylol species to the corresponding aldehyde species in the presence of oxygen and an amount of alkali that is at least stoichiometrically equal to the amount of phenol and a platinum or palladium oxidation catalyst, at a temperature within the range from about 0° to about 100° C. and a pH within the range from about 11 to about 13.5;

(3) separating and recovering the desired aldehyde in the reaction mixture;

(4) selectively decarbonylating to a corresponding phenol undesired aldehyde species to remove all or selected aldehyde groups in selected ring positions by heating the aldehyde species at a temperature within the range from about 75° to about 275° C. in the presence of a palladium catalyst selected from the group consisting of metallic palladium and palladium hydroxide; and then

(5) recycling the phenol as starting phenol to step (1).

4,351,963

ALIPHATIC OLEFIN OXIDATION USING CATALYST CONTAINING SN, P, O, LI

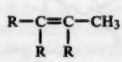
Gardner C. Ray, and Paul W. Solomon, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1981, Ser. No. 228,038

Int. Cl.³ C07C *45/34, 47/20*

U.S. Cl. 568—477 **6 Claims**

1. A method for preparing aldehyde from aliphatic olefin represented by the formula



wherein each R can be hydrogen or any alkyl group having one to 8 carbon atoms, and each R can be the same or different from the other R's, comprising contacting said aliphatic olefin with an oxygen containing gas at an elevated temperature in the presence of a composition comprising phosphorus, tin, oxygen and lithium.

4,351,964

PROCESS FOR PRODUCING ACETALDEHYDE

Seishiro Nakamura, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 8, 1981, Ser. No. 261,805

Claims priority, application Japan, May 19, 1980, 55-66831; May 19, 1980, 55-66832; Mar. 9, 1981, 56-34269

Int. Cl.³ C07C *47/06, 45/41*

U.S. Cl. 568—484 **2 Claims**

1. A process for producing acetaldehyde by reacting acetic anhydride with hydrogen in gaseous phase at a temperature of about 50° to 300° C. and under a pressure of atmospheric to about 20 atmospheres in the presence of palladium metal which is supported on a carrier, the concentration of palladium being in the range of from 0.1 to 5% by weight, based on the weight of the carrier.

4,351,965

NORBORNYL ETHER PREPARATION

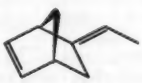
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 220,351, Dec. 29, 1980, Pat. No. 4,308,159, which is a continuation-in-part of Ser. No. 200,012, Oct. 23, 1980, Pat. No. 4,311,861. This application Sep. 25, 1981, Ser. No. 305,469

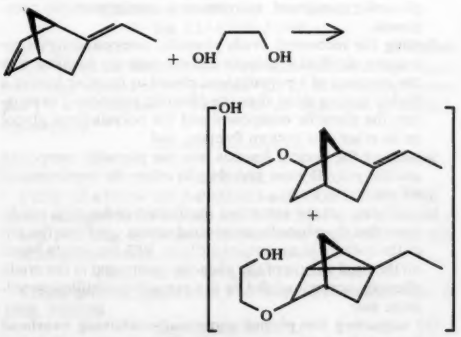
Int. Cl.³ C07C *41/06*

U.S. Cl. 568—665 **1 Claim**

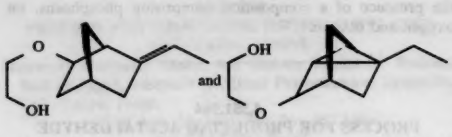
1. The process comprising the step of reacting ethylidene norbornene having the structure:



with ethylene glycol in the presence of a borontrifluoride etherate catalyst at a temperature of 60° C., the mole ratio of catalyst:ethylidene norbornene varying from about 1:99 up to 1:10; the mole ratio of ethylidene norbornene reactant:ethylene glycol reactant varying from about 1:1 up to about 1:2 according to the reaction scheme:



and then recovering a mixture of compounds defined according to the structure:



4,351,966

PHENOL RECOVERY FROM BISPHENOL-A WASTE STREAMS

John W. Flock, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 8, 1971, Ser. No. 271,340
Int. Cl.³ C07C *37/68, 39/04*
U.S. Cl. 568—753 5 Claims

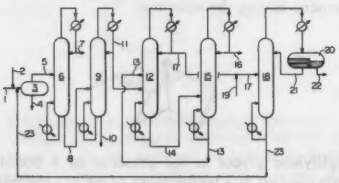
1. The process of cracking a residue derived from the reaction of phenol and acetone in the presence of an acidic catalyst to make bisphenol-A which process comprises contacting the said residue with a molecular sieve catalyst at a temperature from 200° C. to below 500° C. to cause the liberation of phenol from the residue, and collecting the distilled phenol.

4,351,967

PROCESS FOR PRODUCING PHENOLIC COMPOUNDS

Tadahiko Nishimura, Iwakuni; Hiroshi Yamamoto, Ichihara; Masatoshi Osuo, Ichihara, and Akio Kanazawa, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,482
Claims priority, application Japan, Nov. 2, 1979, 54-142448
Int. Cl.³ B01D *3/40*
U.S. Cl. 568—754 11 Claims



1. In a process for producing a phenolic compound which comprises

catalytically cleaving an aralkyl hydroperoxide with an acid to form a phenolic compound,

removing the acid and by-products or impurities having lower and/or higher boiling points than the resulting phenolic compound to recover a crude phenolic compound,

feeding the recovered crude phenolic compound to an extractive distillation column and extractively distilling it in the presence of a polyalkylene glycol or its ether having a higher boiling point than the phenolic compound to separate the phenolic compound and the polyalkylene glycol or its ether as a bottom fraction, and

separating the bottom fraction into the phenolic compound and the polyalkylene glycol or its ether; the improvement wherein

(a) carrying out the extractive distillation under such conditions that the phenolic compound comes out from the top of the column in an amount of 0.3 to 30% by weight based on the total weight of the phenolic compound in the crude phenolic compound fed to the extractive distillation column, and

(b) subjecting the phenol compound-containing overhead fraction from the extractive distillation column to steam distillation and the resulting bottom fraction containing the phenolic compound is recycled to any step after said step of catalytic acid cleavage and before said step of extractive distillation.

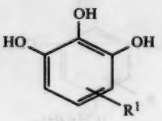
4,351,968

PRODUCTION OF ORGANIC COMPOUNDS

John F. Harris, Cumbridge, England, assignor to FBC Limited, Hauxton, England

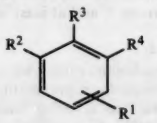
Filed Sep. 12, 1980, Ser. No. 186,556
Claims priority, application United Kingdom, Sep. 14, 1979, 7931996; Dec. 28, 1979, 7944469
Int. Cl.³ C07C *39/10, 37/56*
U.S. Cl. 568—763 9 Claims

1. A process for preparing a pyrogallol compound of the formula



I

or a salt thereof, where R^1 represents a hydrogen atom, alkyl of up to 10 carbon atoms, carboxy or alkoxycarbonyl of 2–5 carbon atoms, which process comprises oxidising a carbonyl compound of the formula



II

or a salt thereof, with hydrogen peroxide at a temperature of 0°–200° C. under basic conditions, where R^1 is as defined above and R^2, R^3 and R^4 are the same or different and each represents —OH or —COR^5, at least one of R^2, R^3 and R^4 representing —OH and at least one of R^2, R^3 and R^4 representing —COR^5, where R^5 represents a hydrogen atom, alkyl of 1–4 carbon atoms or phenylalkyl of 7–10 carbon atoms, the amount of hydrogen peroxide being 0.5–5 moles per mole of the carbonyl compound.

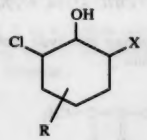
4,351,969

PREPARATION OF CHLOROPHENOLS

Jacques Bourdon, Saint-Auban, France, assignor to Rhone-Poulenc Industries, Paris, France

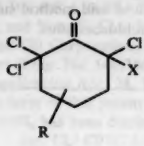
Filed Mar. 17, 1981, Ser. No. 244,688
Claims priority, application France, Mar. 17, 1980, 80 05876
Int. Cl.³ C07C *39/27*
U.S. Cl. 568—774 14 Claims

1. A process for the preparation of a chlorophenol having the structural formula:



(III)

wherein X is hydrogen or chlorine and R is hydrogen or lower alkyl, comprising thermally dehydrochlorinating, at a temperature in excess of about 120° C., a chlorocyclohexanone having the structural formula:



(I)

wherein X and R are as above defined, in the presence of a catalytically effective amount of a catalyst having the formula:

(II)

wherein A is phosphorus or arsenic, R_1 and R_2, which are identical or different, are each hydrogen, an alkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical $—NR_4R_5$, in which R_4 and R_5, which are identical or different, are each H or an alkyl radical having from about 1 to 5 carbon atoms, R_3 is an alkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical $—NR_4R_5$, in which R_4 and R_5 are as defined above, and n is equal to 0 or 1.

4,351,970

METHOD OF PREPARING ALCOHOLS HAVING TWO TO FOUR CARBON ATOMS BY CATALYTIC HYDRATION OF OLEFINS

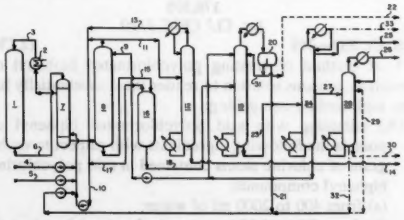
August Sommer; Wilhelm Heitmann, both of Herne, and Rainer Brücker, Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 973,993, Dec. 28, 1978, abandoned. This application May 21, 1980, Ser. No. 151,991

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759237

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—895 **14 Claims**



1. Method of preparing alcohols having 2 or 3 carbon atoms by catalytic hydration of the corresponding olefins on acid catalysts at elevated temperatures and elevated pressure, characterized in that by-products of the hydration including organic soluble by-products which include low-polymerized hydrocarbons which form upon the passage of the input product through the catalyst bed, are separated from the alcohol product and fed to the input product before entry into the reactor, said method being characterized in that:

A. if ethylene is the olefin, the reaction is conducted at a temperature of 200°–300° C. in the gas phase;

B. if propylene is the olefin the reaction is conducted at a temperature of 150° to 220° C. in the gas phase or 120° to 160° C. in the liquid or mixed phase.

4,351,971

PROCESS FOR PREPARING LOWER ALCOHOLS

Kanemaru, Chigasaki; Kenji Yoshida, Fujisawa; Thikashi Higashino, and Tadashi Kozima, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,435

Claims priority, application Japan, May 27, 1980, 55-69591

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—898 **7 Claims**

1. A process for the preparation of lower alcohols by hydration of the corresponding olefins in an aqueous solution, which comprises effecting the hydration reaction in an aqueous solution containing a catalytic system consisting of 0.5 to 2 wt.% of phosphoric acid and 0.5 to 2 wt.% of a heteropolyacid and a chromium compound as an anti-corrosive, the aqueous solution having a pH of 1.4 to 2.4 and reaction being conducted at a temperature of 100° to 300° C.

4,351,972

PROCESS FOR MAKING ANHYDROUS ALKYL IODIDES

Hans K. Kübbeler, Swisttal; Heinz Erpenbach, Cologne; Klaus Gehrmann, and Klaus Schmitz, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,328

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1980, 3032853

Int. Cl.³ C07C *19/02*

U.S. Cl. 570—101 **4 Claims**

1. A process for making anhydrous alkyl iodides, which comprises: reacting carboxylic acid alkyl esters of the formula R^1COOR^2, in which R^1 stands for hydrogen or an alkyl or aryl radical having from 1 to 8 carbon atoms and R^2 stands for an alkyl group having from 1 to 4 carbon atoms, with iodine and hydrogen and optionally carbon monoxide in the presence of compounds of noble metals comprised of rhodium, iridium, palladium or ruthenium as catalyst, and of a heterocyclic aromatic compound, in which at least one hetero atom is a quaternary nitrogen atom, or of a quaternary organophosphorus compound as a promoter, and optionally also in the presence of carboxylic acids having from 1 to 8 carbon atoms and/or their anhydrides, the reaction being effected under practically anhydrous conditions at temperatures of from 350 to 420 K and under a total pressure of up to 30 bars.

4,351,973

STABILIZED METHYLCHLOROFORM

Nobuyuki Ishibe, and Warren F. Richey, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1980, Ser. No. 194,512

Int. Cl.³ C07C *17/42*

U.S. Cl. 570—104 **10 Claims**

1. A stabilized methylchloroform composition comprising a stabilizing amount of (1) pyrazine, (2) 2,2-dimethoxypropane, and (3) a nitroalkane or a furan or an alkylfuran in methylchloroform.

4,351,974

PREPARATION OF 3-BROMO-4-FLUOROTOLUENE

Bernd Baasner; Erich Klauke, and Ernst Kysela, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,413

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008158

Int. Cl.³ C07C *25/13*

U.S. Cl. 570—174 **5 Claims**

1. In the preparation of 3-bromo-4-fluorotoluene by reacting 4-fluorotoluene with bromine, the improvement which com-

prises effecting the bromination in glacial acetic acid in the presence of iodine and iron or an iron salt.

4,351,975

PROCESS FOR PREPARING CHLORINATED COMPOUNDS

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

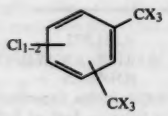
Filed Mar. 24, 1981, Ser. No. 247,087

Claims priority, application Switzerland, Mar. 25, 1980, 2324/80

Int. Cl.³ C07C *17/12*

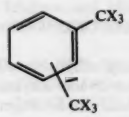
U.S. Cl. 570—209 8 Claims

1. A process for the preparation of a compound of the general formula



(I)

in which the X's are each halogen and may be identical or different, wherein a compound of the general formula



(II)

is reacted with elementary chlorine in chlorosulfonic acid at temperatures of −10° to +25° C.

4,351,976

METHOD FOR PURIFYING 1,2-DICHLOROETHANE

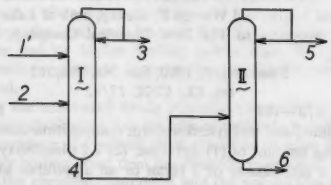
Yusaku Ariki; Takio Hino, and Noboru Yoshida, all of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1981, Ser. No. 246,154

Claims priority, application Japan, Mar. 26, 1980, 55-39591

Int. Cl.³ B01D *3/34*

U.S. Cl. 570—262 4 Claims



1. In a method for purifying, 1,2-dichloroethane by passing through a distillation column a crude 1,2-dichloroethane produced by oxychlorination of ethylene with at least one of a crude 1,2-dichloroethane produced by direct chlorination of ethylene and a crude uncracked 1,2-dichloroethane recovered in thermal cracking of 1,2-dichloroethane, the improvement which comprises feeding a crude, 1,2-dichloroethane produced by the oxychlorination to an upper plate of a distillation column, feeding to a plate sufficiently below said upper plate at least one crude 1,2-dichloroethane of a crude 1,2-dichloroethane produced by the direct chlorination and a crude uncracked 1,2-dichloroethane recovered in thermal cracking, and recovering 1,2-dichloroethane as a bottom product having a substantially non-varying concentration of carbon tetrachloride over a time duration of said method sufficient to catalyze a thermal cracking of dichloroethane.

4,351,977

POLYUNSATURATED BICYCLIC COMPOUNDS, THEIR PREPARATION AND USE OF SAME AS STARTING MATERIALS FOR PREPARING MONOUNSATURATED BICYCLIC COMPOUNDS

Charles Fehr, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

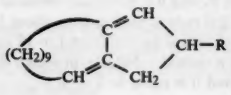
Filed Mar. 9, 1981, Ser. No. 242,013

Claims priority, application Switzerland, Mar. 31, 1980, 2535/80

Int. Cl.³ C07C *13/615*

U.S. Cl. 585—22 2 Claims

1. A compound of formula



(III)

wherein symbol R represents a hydrogen atom or a methyl radical.

4,351,978

METHOD FOR THE DISPOSAL OF POLYCHLORINATED BIPHENYLS

Yasuhiro Hatano, Sakaishi, and Kazumune Nakao, Hyogo, both of Japan, assignors to Osaka Prefectural Government and Daido Sanso Kabushiki Kaisha, both of Osaka, Japan

Continuation-in-part of Ser. No. 80,531, Oct. 1, 1970, abandoned, which is a continuation of Ser. No. 888,530, Mar. 21, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,535

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—469 12 Claims

1. A method of treating polychlorinated biphenyl compounds in aqueous solution to render them substantially harmless, said method comprising:

(A) admixing with said polychlorinated biphenyl compounds the following ingredients with respect to each one gram of chlorine atoms contained in said polychlorinated biphenyl compounds;

(a) from 400 to 2000 ml of water;

(b) from 0.5 to 1.25 gram equivalent weight of an alkali material selected from those metal hydroxides capable of reacting with hydrogen chloride to form a salt;

(c) from 100 to 450 ml of an emulsifying-dispersing agent selected from the group consisting of low molecular weight alcohols;

(d) a hydrogenation catalyst in an effective amount to promote the reaction between hydrogen and said polychlorinated biphenyl compounds;

(B) maintaining said admixture within a pressure range of normal to 100 atmospheres and within a temperature range not higher than 200° C. and, while it is so maintained, introducing gaseous hydrogen in an amount greater than that calculated to be necessary to react with all the chlorines present in the polychlorinated biphenyl compounds.

4,351,979

MANUFACTURE OF AROMATIC COMPOUNDS

Arthur W. Chester, and Yung F. Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 140,346, Apr. 14, 1980, Pat. No. 4,283,584. This application Apr. 24, 1981, Ser. No. 256,872
The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.
Int. Cl.³ C07C 5/22
U.S. Cl. 585—481 23 Claims

1. In a process for isomerizing the xylene content of a charge consisting essentially of eight carbon atom aromatic hydrocarbon compounds which mixture contains xylene, and ethylbenzene by contact at conversion conditions under hydrogen pressure with a catalyst comprising a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, the improvement resulting in conversion of ethylbenzene to benzene which comprises adding to the charge 1 to 25 weight percent based on total charge of paraffin hydrocarbons having 3–12 carbon atoms and having no branching in excess of one methyl group on any carbon atom whereby the charge consists essentially of said eight carbon atom aromatic compounds and said paraffinic hydrocarbons, maintaining the conversion temperature between about 600° F. and about 800° F. and using such catalyst comprising a zeolite of reduced acidity such that less than 2 weight percent of xylene is converted to compounds other than xylene when contacted with said catalyst at 900° F., 200 psig and LHSV of 5.

4,351,980

REMOVAL OF OLEFIN FROM ALIPHATIC HYDROCARBON BY TREATMENT WITH ACTIVE SOLID

Robert E. Reusser; Elizabeth A. Claytor, and Brenton E. Jones, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 22, 1979, Ser. No. 41,454
Int. Cl.³ C07C 7/12
U.S. Cl. 585—820 6 Claims

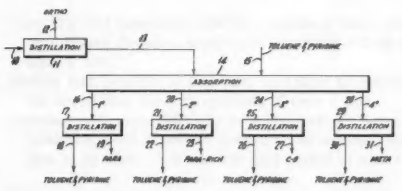
1. A process for the removal of a small amount of an odor-forming impurity of the order of a few parts per million from a low boiling isoparaffin hydrocarbon aerosol propellant for spray-type application which comprises contacting said hydrocarbon with a solid-acid treated montmorillonite clay catalyst effective to remove said odor-forming impurity.

4,351,981

SEPARATION OF PARA-XYLENE

William Smolin, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 23, 1980, Ser. No. 152,865
Int. Cl.³ C07C 7/13
U.S. Cl. 585—828 35 Claims



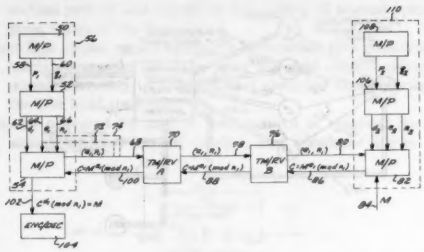
1. The process for separating para-xylene from a feed mixture containing C-8 aromatic hydrocarbons including para-xylene which comprises contacting said feed mixture with, as an adsorbent, a pyridine or substituted pyridine-containing sodium X zeolite or lithium X zeolite thereby selectively adsorbing substantially all of said C-8 aromatic hydrocarbons to the substantial exclusion of para-xylene; and recovering said para-xylene.

4,351,982

RSA PUBLIC-KEY DATA ENCRYPTION SYSTEM HAVING LARGE RANDOM PRIME NUMBER GENERATING MICROPROCESSOR OR THE LIKE

William J. Miller, North Miami, and Nick G. Trbovich, Hollywood, both of Fla., assignors to Racal-Milgo, Inc., Miami, Fla.

Filed Dec. 15, 1980, Ser. No. 216,435
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.11 **22 Claims**



21. In a public-key data encryption system employing RSA public-key data encryption, a large random prime number generating means for generating large randomly selected prime numbers necessary for RSA public-key data encryption, each having a desired length, the random prime number generating means including a large-scale integrated circuit means for performing the following operations in selecting each of the necessary large random prime numbers:

starting with a P, which is a known prime number having a length which is relatively short in comparison to the desired length, forming a sequence of prime numbers in the form $hP+1$, wherein P is the current prime number in the computed sequence of prime numbers, by selecting at random an h and forming $hP+1$ and testing $hP+1$ for primality by determining first if the greatest common divisor (GCD) of $[(hP+1), (x)]$ is one, wherein x is a composite number consisting of the product of known prime numbers less than or equal to a selected known prime, and if the GCD is equal to 1, determining if both $2^{hP} \equiv 1$ [mod $(hP+1)$] and $2^{h} \not\equiv 1$ [mod $(hP+1)$], and if the GCD is not equal to 1, or if the GCD is equal to 1, but either $2^{hP} \not\equiv 1$ [mod $(hP+1)$] or $2^{h} \equiv 1$ [mod $(hP+1)$], incrementing h to form a new $hP+1$, but if both $2^{hP} \equiv 1$ [mod $(hP+1)$] and $2^{h} \not\equiv 1$ [mod $(hP+1)$], determining if $hP+1$ is greater than or equal to the desired length, and if greater than or equal to the desired length, then setting $hP+1$ as one of the necessary large randomly selected prime numbers, and if not greater than or equal to the desired length, then placing $hP+1$ in the sequence of prime numbers and repeating the above steps using $hP+1$ as the new P and commencing by selecting a new h as above set forth.

4,351,983

SPEECH DETECTOR WITH VARIABLE THRESHOLD

William G. Crouse, and Charles R. Knox, both of Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 17,791, Mar. 5, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,504
Int. Cl.³ G10L *1/04*; H04B *15/00*
U.S. Cl. 179—1 SC **3 Claims**

1. In a communication system having means for adjustably setting a detection threshold value for an incoming signal stream above which threshold value speech signals are defined to exist and below which threshold value no speech signals are defined to exist, a method for periodically adjusting and setting a new operative level for said detection threshold, comprising steps of:

instantaneously sampling the signal level of said incoming signal stream n times in a period of time t;

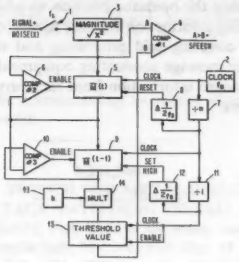
measuring the magnitude M of each said sample;

comparing the magnitude M of each successive said sample with the magnitude M of the preceding said sample;

storing the largest magnitude M encountered during said period of time t as the peak sample magnitude M(t);

comparing said value M(t) to a previous value $M(t-1)$ which represents the smallest M(t) from prior periods of time t; and

following said comparison, storing the lesser of said two magnitudes as the new value $M(t-1)$;



repeating said foregoing steps for i periods of time t and then multiplying the latest existing value of $M(t-1)$ by a constant k; and

storing said product as said new operative threshold level for use during the next i periods of time t; and

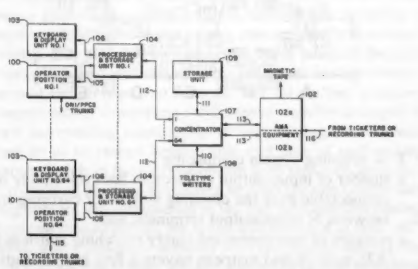
resetting said value $M(t-1)$ to a level above that for the minimum level of speech desired to be detected for samples to be taken over the next said period of time t.

4,351,984

APPARATUS FOR USE IN A TELEPHONE EXCHANGE INCLUDING AN OPERATOR CORDBOARD POSITION

Robert E. Young, Clarendon Hills, and Richard K. Huffman, Hoffman Estates, both of Ill., assignors to Northern Telecom, Inc., Nashville, Tenn.

Filed Jul. 25, 1980, Ser. No. 172,236
Int. Cl.³ H04M *3/60*
U.S. Cl. 179—7.1 R **9 Claims**



1. Apparatus for use in a telephone exchange having a plurality of operator positions one or more of which are operator cordboard positions, said apparatus comprising:

a plurality of information entry and display means each associated with a respective operator position, each information entry and display means comprising means for entering and displaying information relating to telephone connections which are established using the respective operator position;

a plurality of independently operable processing and storage means each coupled to an individual respective one of said information entry and display means;

means for coupling each processing and storage means to the operator position which is associated with the information entry and display means which is coupled to the respective processing and storage means;

each processing and storage means being arranged for monitoring the operator position to which it is coupled, checking information entered via the information entry and display means to which it is coupled, controlling the display of information by the information entry and display means to which it is coupled, timing connections established using the operator position to which it is coupled, and storing information relating to said connections; and

means for coupling said processing and storage means to automatic message accounting equipment for transferring thereto stored information from each processing and storage means.

4,351,985

COUPLING SYSTEM FOR A TELECOMMUNICATION EXCHANGE INSTALLATION

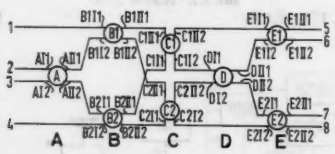
Max Schlichte, Munich, and Wolf Springstubbe, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 765,342, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 644,866, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 386,281, Aug. 7, 1973, abandoned, which is a continuation of Ser. No. 163,588, Jul. 19, 1971, abandoned. This application Apr. 5, 1979, Ser. No. 27,354

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1970, 2036176

Int. Cl.³ H04Q *3/52*

U.S. Cl. 179—18 GF **13 Claims**



1. A coupling system comprising:

a number of input/output connection lines selectively interconnectable over the coupling system for carrying traffic between N input/output terminals, and

a plurality of interconnected binary switching matrices (A1, A2), each of said matrices having a first pair of leads (I1, I2) and a second pair of leads (II1, II2), each of said first lead pairs being selectively connectable over said matrix to one of said second lead pairs,

at least one of said matrices (A1) having one of said first lead pairs (A1I1) connected to one of said connection lines (1),

the other lead of said first lead pair (A1I2) of said one matrix being connected to one lead of the second lead pair (A2II1) of another of said matrices,

one lead of said second pair (A1II2) of said one matrix being connected to one lead of said second lead pair (A2II2) of said another matrix (A2), and

the other lead of said second pair (A1II1) of said one matrix being connected to one of said connection lines (3).

4,351,986

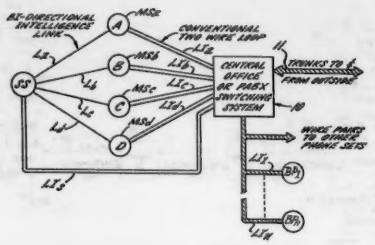
ELECTRONIC TELEPHONES WITH COOPERATIVE INTERACTION BETWEEN A MASTER SET AND MEMBERS' SETS IN A GROUP

William A. Fechalos, Naperville, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Sep. 19, 1980, Ser. No. 188,925

Int. Cl.³ H04M *1/27, 1/64*

U.S. Cl. 179—27 FH **39 Claims**



9. In a telephone group which includes a secretary's phone set (hereinafter SS) and at least one member's set (hereinafter M_S), each of said sets being served by a central system (CO or PABX) via its own two wire line with its own directory number, the combination comprising

(a) means in the SS for picking up an incoming call which is producing ringing on the MS line,

(b) means for producing a status signal PU in the SS when a call originally intended for the MS has been picked up,

(c) a group hold switch S_{gh} in the SS, and

(d) means in the SS responsive to actuation of said switch S_{gh} when the status signal PU exists for outputting on the SS line a unique sequence of dial digit signals to the central system,

said sequence including a first group representing a hold code and a second group representing the directory number for the MS.

29. In a telephone set adapted to automatically send out "speed dialed" dial digit signals, the combination comprising

(a) a read/write memory having a plurality of blocks of word addresses, each block corresponding to a dial digit sequence to be sent out,

(a1) each block having a starting address with the word therein contained being a bit code for the first digit of a digit sequence,

(a2) the words at addresses sequentially following said starting address being bit codes for the second and subsequent digits of a digit sequence, and

(a3) all other words within a block at addresses after the last digit word of the sequence containing a bit code for "last digit" LD,

(b) means, when initiated into operation, for reading the first and successive addresses of a block seriatum and outputting a dial digit signal as a consequence of reading each address, each dial digit signal corresponding to the bit code of read-out signals from one address, and

(c) means responsive to read out of a "last digit" LD bit code for terminating the operation of said means (b).

4,351,987

TELEPHONE LINE CIRCUIT HOLD ARRANGEMENT

Thomas E. Feil, New York, N.Y., assignor to V-Band Systems, Inc., New York, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,372

Int. Cl.³ H04Q *5/18*

U.S. Cl. 179—99 H **8 Claims**

1. A hold circuit arrangement for a telephone line circuit for controlling the hold function between a two conductor PBX or central office telephone line and at least one telephone

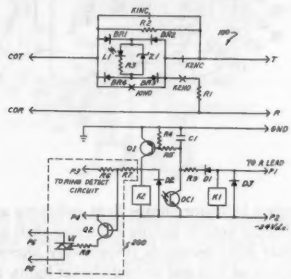
station without introducing an undesireable series impedance condition in the longtudinal path of the telephone line during any of the line circuit's normal operating states, said line circuit adapted for ring detection, lamp control and for A lead control between said station and said line circuit, said hold circuit arrangement comprising:

means for generating an energizing signal in response to the presence of d.c. current in said telephone line,

first and second circuit means for establishing an electrical shunt by passing said energizing signal means in the longitudinal path of said telephone line during all normal operating states of the line circuit,

said first circuit means operating to establish said electrical shunt during the line busy state and said second circuit means operating to establish said electrical shunt during the line hold state,

means operated by said A lead control in response to a station initiated request to place said telephone line in a



hold condition for momentarily switching said energizing signal means in an electrical series connection in the longitudinal path of said telephone line during the transition from the line busy to the line hold condition, whereby said energizing signal is generated if d.c. current is present in said telephone line,

hold means for establishing a hold bridge connection across said telephone line throughout the hold condition, said hold means operated in response to said energizing signal,

said hold means including means for shunting said energizing signal means across the longtudinal path of said telephone line in a series path with the hold bridge upon establishment of the requested hold condition whereby said energizing signal will continue to be generated so long as d.c. current continues to be present in said telephone line, and

means for signaling the release of the hold bridge connection in response to the termination of the hold condition.

4,351,988

KEYBOARD SWITCH ASSEMBLY

Forrest E. Allbright, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1980, Ser. No. 213,974

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **14 Claims**

1. A keyboard assembly comprising:

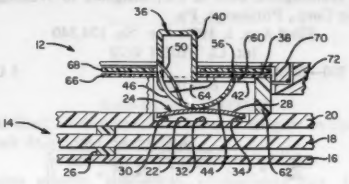
base means;

switching assembly means disposed on said base means and including a plurality of switching means;

keyboard means operatively associated with the base means overlying and adjacent to the switching assembly means, having a plurality of keys each disposed in operative relation to one of the switching means;

said keyboard means including support means to which each key is integrally hinged, said support means being apertured to permit movement of each key therethrough;

each of said keys including a switch actuating means of cantilever configuration extending beneath said key from one side thereof to an opposite side thereof and positioned



to engage the corresponding switching means when said key is depressed.

4,351,989

DISCONNECT SWITCH FOR METAL-ENCAPSULATED HIGH-VOLTAGE SWITCHING INSTALLATIONS

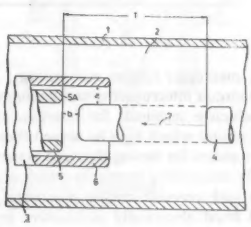
Günther Luxa, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,943

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2704385

Int. Cl.³ H01H *31/00*

U.S. Cl. 200—48 CB **4 Claims**



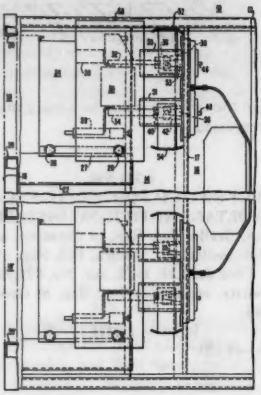
1. In a disconnect switch for use in a metal-encapsulated high-voltage switching installation at voltages of 245 kV and above which includes a tubular grounded encapsulation containing a gaseous insulating medium, said switch including a movable switching pin and a mating contact axially associated therewith, said movable switching pin being adapted for axial movement toward and engagement with said mating contact when said switch is moved from an "off" to an "on" position, the improvement comprising a cylindrical member arranged in spaced surrounding relationship to said mating contact and formed so as to extend beyond that end face of said mating contact which is in facing relationship with said switching pin, said cylindrical member projecting beyond the end face of said mating contact and terminating in the gap between said mating contact and said switching pin when said switch is in said "off" position, said cylindrical member also projecting beyond the end face of said switching pin and surrounding said switching pin when said switch is in said "on" position, said cylindrical member being radially spaced apart from the surface of said switching pin by a distance which is greater than a preliminary breakdown axial distance between said mating contact and said switching pin at which breakdown between said mating contact and switching pin occurs as said switching pin moves towards said mating contact as said switch is moved to said "on" position, so that when said switch is moved to said "on" position, a preliminary breakdown takes place during movement of said movable switching pin to said "on" position of said switch only between said switching pin and said mating contact and not between said switching pin and said cylindrical member.

4,351,990

INTERPHASE BARRIER FOR SWITCHGEAR

Glenn A. Hesselbart, Plum Borough, and Robert E. Wobrak, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1980, Ser. No. 174,340
Int. Cl.[3] H01H 9/22
U.S. Cl. 200—50 AA 4 Claims



1. A circuit interrupter system, comprising:

(a) movable circuit interrupter means having spaced electrically conductive terminals for interconnection with an electrical circuit which is to be served thereby;

(b) enclosure means for having disposed as part thereof fixed electrically conductive terminals which are complementary with said movable circuit interrupter means terminals, said fixed electrically conductive terminals being interconnectable with said electrical circuit, said enclosure means having an opening therein or predetermined magnitude in a given dimension through which said movable circuit interrupter means moves for removal thereof from said enclosure means;

(c) shutter means disposed within said enclosure means for being alternatively placed to shield said fixed complementary terminals when said terminals of said movable circuit interrupter means are not in electrical contact with said fixed terminals or placed to expose said fixed complementary terminals when said terminals of said movable circuit interrupter means approach a disposition of electrical contact with said fixed terminals; and

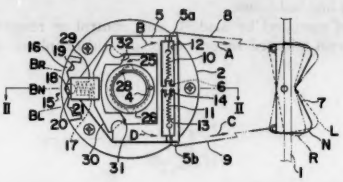
(d) movable electrically insulating barrier means having a maximum displacement in said dimension which is larger than said predetermined magnitude, the difference in displacement between said predetermined magnitude and said maximum displacement providing a related incremental increase in the voltage breakdown characteristic of said barrier means, said barrier means being movably disposed within said enclosure means to a first disposition between said movable spaced terminals when said movable spaced terminals are interconnected with said fixed complementary terminals for thus increasing the voltage breakdown distance between said movable terminals, said barrier means being movably disposed within said enclosure means to a second disposition when said circuit interrupter means is removed from said enclosure means for allowing said shutter means to be disposed to shield said fixed complementary terminals.

4,351,991

DIRECTION INDICATOR BLINKER LIGHT SWITCHING ARRANGEMENT

Masayuki Morita, Tokoname, and Tasuku Nakano, Mizunami, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 14, 1980, Ser. No. 207,070
Claims priority, application Japan, Nov. 22, 1979, 54-151714; Dec. 12, 1979, 54-172008[U]
Int. Cl.[3] H01H 3/16
U.S. Cl. 200—61.27 19 Claims



1. A direction indicator blinker light switching arrangement for use in a motor vehicle having a steering shaft and first and second blinker light terminals respectively alternatively engageable to turn on first and second blinker lights, comprising:

an actuator, pivotally mounted to said vehicle, located within reach of a driver of said vehicle and selectively movable between a first neutral position and a first actuating position and between said first neutral position and a second actuating position directionally opposite said first actuating position;

a turn signal switch for engaging said first blinker light terminal to generate a first turn signal when said actuator is in said first actuating position, and for engaging said second blinker light terminal to generate a second turn signal when said actuator is in said second position; and

means for cancelling a selected positioning of said actuator in said first and second positions, said cancelling means including (1) a cancelling mechanism including:

(a) a ratchet pivotally movable in a first direction between a second neutral position and a first switching position and in a second direction between said second neutral position and a second switching position directionally opposite said first switching position; and

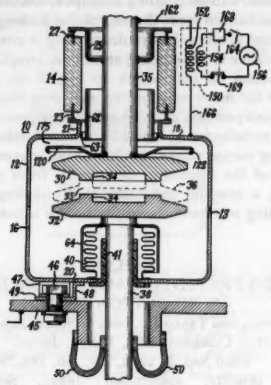
(b) a cancelling cam adjacent to said steering shaft, and rotatable in said first and second directions in response to rotation of said steering shaft, said cancelling cam being engageable with said ratchet to move said ratchet respectively from said first and second switching positions to said neutral position when said ratchet is rotated in said second and first directions, respectively, said actuator being spaced from said cancelling mechanism; and

(2) interconnection means, connecting to said actuator and coupleable with said cancelling mechanism, for transmitting drive forces to move said ratchet from said second neutral position to said first and second switching positions in response to movement of said actuator from said first neutral position to said first and second actuating positions, respectively, and to move said actuator from said first and second actuation positions to said first neutral position in response to movement of said ratchet respectively from said first and second switching positions to said second neutral position.

4,351,992
HIGH-POTENTIAL TESTING OF VACUUM-TYPE CIRCUIT INTERRUPTERS

Donald W. Crouch, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 5, 1979, Ser. No. 91,027
Int. Cl.[3] H01H 33/66
U.S. Cl. 200—144 B 5 Claims



1. For use with a vacuum-type circuit interrupter that has a relatively low voltage rating and (i) comprises a pair of separable contacts that are fully separated when the interrupter is opened, (ii) further comprises an envelope having an interior that is normally at a vacuum, the envelope comprising a metal housing electrically connected to one contact and surrounding said pair of contacts and an insulator at one end of the metal housing electrically isolating the other of said contacts from said metal housing, and (iii) is susceptible to external spark-over across said insulator when subjected to high potentials applied between its fully-separated contacts of an effective value equal to a predetermined minimum value sufficient to consistently produce a spark-over between said fully-separated contacts when the space within said interrupter is at atmospheric pressure; a method of assuring, during testing for loss-of-vacuum with high potential higher than normal operating voltage, that a spark-over will occur internally of said interrupter envelope when subjected to high potentials having an effective value substantially lower than said predetermined minimum value when said interrupter space is at atmospheric pressure, comprising:

(a) providing within said interrupter envelope two spaced-apart metallic parts across which appears a potential equal to that applied between said fully-separated contacts, one of said metallic parts being a shield electrically connected to said other contact and extending alongside said metallic housing in spaced relationship thereto, the other of said metallic parts being a portion of said metallic housing located adjacent said shield,

(b) utilizing for the opposing regions of said metallic parts one or more metals that in a vacuum are characterized by higher dielectric strength than the metal or metals used for the opposing regions of said contacts, and

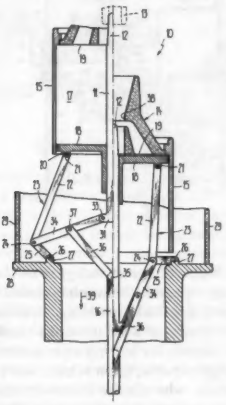
(c) providing a gap between the opposing regions of said metallic parts that is of such length and configuration that it is subjected to substantially higher maximum voltage stresses than the gap between said fully-separated contacts when a high potential is applied across the gap between said fully-separated contacts,

(d) said gap between said metallic parts having: (i) a length sufficiently short that when at atmospheric pressure it will spark-over at high potentials having an effective value substantially lower than said predetermined minimum value and (ii) a minimum length shorter than the gap between said fully-separated contacts.

4,351,993
GAS-BLAST SWITCH

Rudolf Graf, Obermuhen, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Sep. 2, 1980, Ser. No. 183,429
Claims priority, application Switzerland, Nov. 16, 1979, 10246/79
Int. Cl.[3] H01H 33/88
U.S. Cl. 200—148 A 3 Claims



1. A gas-blast switch comprising:

a movable contact element;

a drive rod;

a step-up lever drive for operatively coupling said movable contact element with said drive rod;

a blast nozzle surrounding said contact element and movable along with said movable contact element;

a pump cylinder containing an extinguishing gas;

said blast nozzle being connected with said pump cylinder;

a pump piston upon which there is displaceably guided said pump cylinder;

a toggle lever having a first element and a second element;

said pump piston being hingedly connected with one end of said first element of said toggle lever which in a cut-on position of the gas-blast switch is located in a bent position of the toggle lever;

means defining a stationary location with which there is hingedly connected said second element;

said toggle lever containing a toggle joint operatively coupled with said drive rod, so that during a cut-off stroke of the gas-blast switch the toggle lever is extended and then again bent;

said lever drive comprising a first coupling element and a second coupling element;

said first coupling element being connected at one end with said toggle joint and at its other end with said movable contact element; and

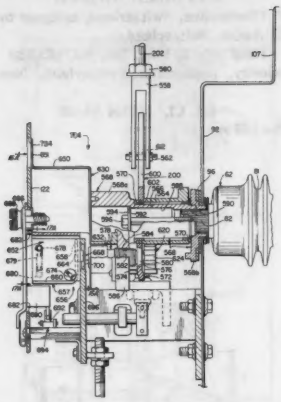
said second coupling element being connected at one end between the opposed ends of said first coupling element at said first coupling element and at its other end being hingedly connected with said drive rod, so that at the start of the cut-off stroke the bent position of the toggle lever initially is intensified.

4,351,994

HIGH-VOLTAGE SWITCHGEAR

David M. Evans, Palantine, and Roy T. Swanson, North Riverside, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 1, 1980, Ser. No. 136,632
Int. Cl.³ H01H *3/32*
U.S. Cl. 200—153 SC **29 Claims**



1. Improved high-voltage switchgear of the type having a switch selectively operable between a closed position and an open position and a switch-operating mechanism which can assume a switch-closed or a switch open condition due to the action of means therein for storing a predetermined amount of mechanical energy capable, upon release thereof, of closing or opening the switch, wherein the improvement comprises:

first electrical means for re-storing the predetermined amount of energy in the energy storing means in response to, and after, the release of energy previously stored therein, the re-stored energy being capable of placing the operating mechanism in the condition opposite that assumed by the operating mechanism during the release of the previously stored energy;

first mechanical means responsive to selective manual manipulation thereof for re-storing the predetermined amount of energy in the energy storing means after the release of energy previously stored therein, the re-stored energy being capable of placing the operating mechanism in the condition opposite that assumed by the operating mechanism during the release of the previously stored energy;

second electrical means for releasing energy stored in the energy storing means;

second mechanical means for releasing energy stored in the energy storing means in response to selective manual manipulation thereof;

first preventing means responsive to the ongoing restoration of energy in the energy storing means by either the first electrical means or the first mechanical means for preventing the release of any energy by the second mechanical means until the predetermined amount of energy is re-stored;

second preventing means responsive to the ongoing restoration of energy in the energy storing means by the first mechanical means for preventing both (a) the re-storing of energy in the energy storing means by the first electrical means and (b) the release of any energy in the energy storing means by the second electrical means, at least until the predetermined amount of energy is re-stored;

means responsive to selective manual manipulation thereof for coupling the operating mechanism to or decoupling the operating mechanism from the switch whether or not energy is stored in the energy storing means and regardless of the condition of the operating mechanism;

means responsive to the decoupling of the operating mechanism from the switch for dissipating energy stored in the operating mechanism and for preventing damage to the switch and to the operating mechanism by such dissipated energy; and

means

(a) responsive to an ongoing attempt to decouple the operating mechanism from the switch for locking the switch in its extant position before decoupling is completed and

(b) responsive to an ongoing attempt to couple the operating mechanism to the switch to permit its unlocking the switch for movement by the operating mechanism out of its extant position after coupling is completed.

18. The switchgear of claim 17, which further comprises:

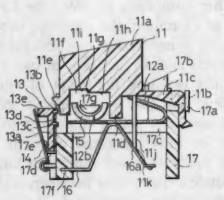
indicating means responsive to partial or completed decoupling of the operating mechanism from the switch for giving a sensible indication that coupling between the operating mechanism and the switch is not completed.

4,351,995

VIBRATION-PREVENTING MECHANISM FOR USE IN A PUSH BUTTON SWITCH

Akihiko Inoue, and Takeo Ito, both of Soma, Japan, assignors to Alps Electric Company, Ltd., Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,284
Claims priority, application Japan, Sep. 8, 1979, 54/124338[U]
Int. Cl.³ H01H *3/12, 13/66*
U.S. Cl. 200—159 A **3 Claims**



1. In a push button switch including a plurality of push buttons having means for deflecting resilient contacts and having a spring member engaging said push buttons to urge them in a direction opposite that for deflecting the resilient contacts, the improvement including means for preventing the resilient contacts from vibrating upon release of the deflecting force from the associated push button, said means including a respective projection formed on the lower portion of said push buttons and extending towards a respective contact and dimensioned to prevent the associated contact from vibrating.

4,351,996

INDUCTION HEATING APPARATUS WITH THERMISTOR AND MAGNETIC SENSOR

Shigeki Kondo, Tachikawa; Tomofumi Iketani, Fuchu; Yoshio Yamazaki, Yoshikawa; Keiichiro Doi, Izumi, and Seiji Tanaka, Yamatokoriyama, all of Japan, assignors to Riccar Co., Ltd. and Sharp Kabushiki Kaisha, both of Osaka, Japan

Filed Jan. 28, 1981, Ser. No. 229,298
Claims priority, application Japan, Jan. 30, 1980, 55-10735; Dec. 15, 1980, 55-180670[U]
Int. Cl.³ H05B *6/12*
U.S. Cl. 219—10.49 R **7 Claims**

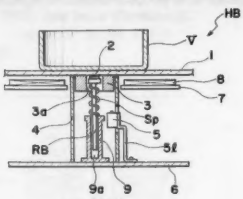
1. An induction heating apparatus having an induction heating coil provided below a top plate means for supporting a container of magnetizable material thereon, said induction heating apparatus comprising:

thermistor element means provided on the undersurface of

said top plate means for controlling energization of said induction heating coil;

magnet member means movably provided below said top plate means so as to be raised through attraction thereof to a said container of magnetizable material on said top plate means; and

switching member means provided below said magnet member means for selective energization and de-energization of said induction heating coil in response to the movement of said magnet member means;



said magnet member means being formed to define bore means therethrough in a predetermined position corresponding to said thermistor element means so as to accommodate said thermistor element means into said bore means upon raising of said magnet member means for preventing collision therebetween and for providing access to said thermistor element means from beneath said magnet member means; and

said apparatus further comprising support means for thermistor element means extending through said bore means.

4,351,997

FOOD PACKAGE

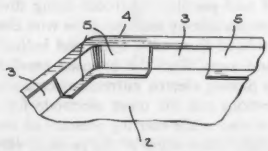
Lennart Mattisson, Kagenrod, and Bertil Ganrot, Bjuv, both of Sweden, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Aug. 20, 1980, Ser. No. 179,635

Claims priority, application Sweden, Aug. 27, 1979, 7907117

Int. Cl.³ H05B *6/80*

U.S. Cl. 219—10.55 E **7 Claims**



1. A food package for controlled heating of prepared food in hot air, convection, household and microwave ovens, said package comprising a tray including a bottom wall transparent to microwave radiation and a peripheral structure, said peripheral structure including a peripheral wall extending upwardly from said bottom wall and a rim extending outwardly from said peripheral wall at the top thereof, at least a portion of said peripheral structure incorporating a microwave radiation reflecting material.

4,351,998

MICROWAVE OVEN WITH RESISTANCE HEATING UNIT

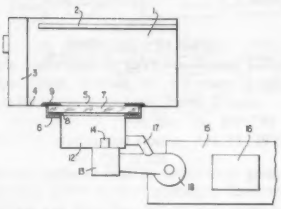
Heinrich Keppel, Nuremberg; Peter Klapper, Schwabach, and Herbert Fleischmann, Nuremberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,332

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946767

Int. Cl.³ H05B *6/70*

U.S. Cl. 219—10.55 R **2 Claims**



1. In an oven including walls defining a cooking chamber; means defining a microwave window in one of said walls; a glass-ceramic plate covering said window; a securing frame affixed to said one wall and immobilizing said plate by engaging peripheral portions thereof; a microwave connecting housing adjoining said window externally of said cooking chamber; microwave generating and guiding means bounding at least in part the space defined by said connecting housing for directing microwave energy into said cooking chamber through said connecting housing and said window; and electric resistance heating means operatively connected with said cooking chamber; the improvement comprising

(a) a high-temperature resistant seal interposed between said securing frame and said plate; said seal being bonded to said one wall and said plate;

(b) a cooling system for ventilating the oven; the cooling system including pressure means for circulating air; said pressure means having a pressure side; and

(c) a conduit maintaining communication between said pressure side and said space defined by said connecting housing for maintaining said space at an overpressure that is greater than the pressure prevailing in said cooking chamber.

4,351,999

HEATING APPARATUS PROVIDED WITH A VOICE SYNTHESIZING CIRCUIT

Shunichi Nagamoto; Masao Ito, both of Nara; Tatsuo Saka, Ikoma, and Tetsu Kobayashi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 23, 1980, Ser. No. 220,234

Claims priority, application Japan, Dec. 26, 1979, 54-172044; May 26, 1980, 55-70435

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **14 Claims**

1. A heating apparatus comprising

an enclosure case having therein a heating chamber in which an object to be heated is to be placed, said enclosure case having a door at an opening of said heating chamber,

a heating means for generating heating energy in said heating chamber,

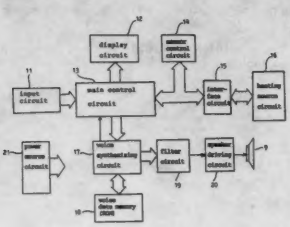
a plurality of operation buttons interconnected with a key input means for inputting predetermined heating sequence data,

a voice data memory means for storing synthesizing voice data corresponding to predetermined heating sequence data,

a voice synthesizing circuit for producing synthesized voice signals from said synthesizing voice data stored in said voice data memory means,

a speaker for generating synthesized voices upon receipt of said synthesized voice signals from said voice synthesized circuit, and

microcomputer control circuit means for controlling circuit operations of said voice synthesizing circuit, and control-



ling heating operations of said heating means following predetermined sequence orders when heating sequence data are given thereto through said key input means said microcomputer control circuit means comprising a built-in read only memory (ROM) for storing programs comprising a first algorithm for checking the validity of key input data and a second algorithm for actuating said voice synthesizing circuit only when said key input data are determined to be valid based on predetermined criteria.

4,352,000

INDUCTION HEATING COOKING APPARATUS

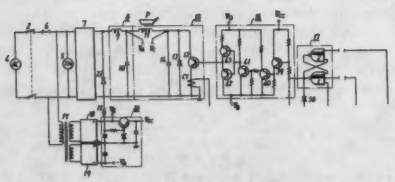
Kunihiro Fujishima, Moriyama, and Takaki Kuramoto, Kyoto, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 29, 1980, Ser. No. 173,469

Claims priority, application Japan, Aug. 10, 1979, 54/102453; Oct. 25, 1979, 54-148679[U]

Int. Cl.³ H05B *5/04*

U.S. Cl. 219—10.77 **38 Claims**



1. An induction heating cooking apparatus, comprising:

power supply means having a particular polarity output voltage,

self-controlled inverter means energized by said power supply means,

said self-controlled inverter means comprising

an induction coil and a switching element connected in series with said power supply means,

a resonance capacitor connected in parallel with said switching element, and

a one directional current flow device connected in parallel with said switching element in a reversed polarity with respect to the power supply voltage,

start signal generating means responsive to a turning on of said power supply means for generating a start signal for starting said self-controlled inverter means,

current level detecting means for detecting the level of current flowing through said switching element after said self-controlled inverter means is started,

first control means for controlling said switching element so as to put it into a non-conductive state when the current level detected by said current level detecting means reaches a predetermined current value,

voltage level detecting means for detecting the level of the terminal voltage of said resonance capacitor, and

second control means for applying a voltage to said switching element tending to put it into a conductive state when the voltage level detected by said voltage level detecting means becomes smaller than a predetermined value, said first and second control means causing said inverter means to oscillate at a predetermined frequency.

4,352,001

METHOD AND APPARATUS FOR PRODUCING WELDED METALLIC CAN BODY

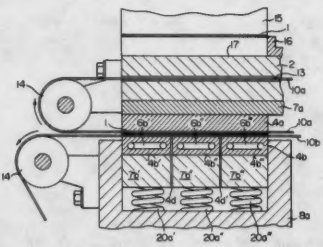
Kazuhisa Ishibashi, Tokyo; Sadaki Matsui, Machida; Hisakazu Yasumuro, Yokohama; Tsuneo Imatani; Hiroshi Ueno, both of Yokosuka, and Seishichi Kobayashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,846

Claims priority, application Japan, Sep. 26, 1979, 54-122546

Int. Cl.³ B23K *1/16*

U.S. Cl. 219—64 **19 Claims**



1. A method for producing a welded metallic can body from a metal blank bent into a cylindrical can-like structure with marginal side edges overlapped, comprising: holding the overlapped edges of the can-like structure along the entire length of the structure between a pair of opposed parallel wire electrodes positioned on the opposed surfaces of parallel electrodes, one of said parallel electrodes being divided into a plurality of portions side-by-side along the wire electrodes and electrically insulated from each other and individually movable toward and away from the opposed parallel electrode; simultaneously passing electric currents electrically in parallel across said portions and the other electrode for a predetermined period of time while exerting pressure on the individual electrode portions independent of the pressure exerted on the other portions for pressing the wire electrodes against the overlapped edges for subjecting the overlapped edges to substantially uniform pressure along the entire length of said parallel electrodes resistance welding, and supplying the electric currents through at least one of said portions from an electric current source independent from the electric current source for the current through the other portions and the respective currents having current level values for causing the temperature rise in the overlapped edges of the can body-like structure to be uniform along the length of the overlapped edges.

4,352,002

ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE

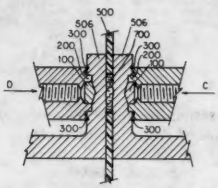
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 5,669, Jan. 22, 1979, Pat. No. 4,256,946, which is a continuation of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Feb. 18, 1981, Ser. No. 235,705

The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.³ B23K *11/30*

U.S. Cl. 219—78.15 12 Claims



1. In an apparatus having electrodes for extruding and electrically fusing lead parts through an aperture in a battery case to form a connection therethrough, said aperture having a substantially flat surface region disposed around the perimeter thereof, the improvement wherein said electrode comprises a forging means for deforming an exterior portion of said lead parts in an area generally surrounding said aperture which is adjacent said flat surface region to thereby prevent expulsion of molten metal compressed within said aperture.

4,352,003

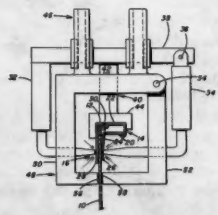
METHOD FOR POSITIONING AND SECURING COMPONENTS OF A WORKPIECE

Peter J. Arnoldt, Clairton, Pa., assignor to Ductmate Industries, Inc., Pittsburgh, Pa.

Filed Sep. 17, 1979, Ser. No. 76,205

Int. Cl.³ B23K *11/10, 37/04*

U.S. Cl. 219—103 7 Claims



1. The method for positioning and securing components of a workpiece comprising,

positioning a second workpiece component on a first workpiece component relative to a fixed frame,

engaging said first workpiece component by clamp means positioned on said fixed frame,

supporting a welding machine for movement relative to said fixed frame toward and away from said second workpiece component,

moving said welding machine to move a positioning means into abutting relation with said second workpiece component and move said second workpiece component relative to said first workpiece component until said second workpiece component is positioned at a preselected location relative to said first workpiece component,

moving opposed electrodes relative to said positioning means on said welding machine into abutting relation with said workpiece first and second components after the second workpiece component is positioned at said preselected location, and

passing welding current between said opposed electrodes through said first and second workpiece components to secure said second workpiece component to said first workpiece component at a preselected location on said second workpiece component.

4,352,004

JOINING PROCESS

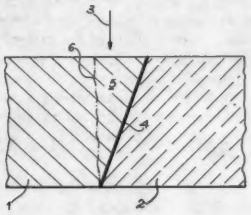
Yvon Gervais, Saint Martin D'Heres; Renen Gillet, Grenoble, and Georges Tanis, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 17, 1980, Ser. No. 169,780

Claims priority, application France, Jul. 18, 1979, 79 18609

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 ED 4 Claims



1. A process for joining by electron beam bombardment a copper member to a member made from a refractory metal, wherein a layer of metal selected from the group consisting of chrome and nickel is deposited on the copper member in the area where the electron beam brings about fusion, said refractory material being selected from the group consisting of molybdenum, tungsten, niobium, tantalum, and alloys thereof.

4,352,005

TRIMMING A CIRCUIT ELEMENT LAYER OF AN ELECTRICAL CIRCUIT ASSEMBLY

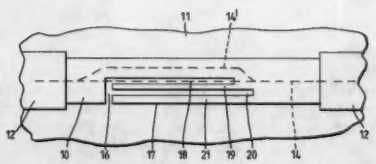
Jonathan L. Evans, and William H. Learmonth, both of Edinburgh, Scotland, assignors to Ferranti Limited, Cheadle, England

Filed Nov. 18, 1980, Ser. No. 207,890

Claims priority, application United Kingdom, Nov. 23, 1979, 7940615

Int. Cl.³ B23K *9/00*; B26D *3/00*

U.S. Cl. 219—121 LJ 1 Claim



1. A method of trimming a layer of material deposited on a substrate, the layer to comprise at least part of a constituent circuit element of an electrical circuit assembly, at least one pair of spaced terminals being provided for the layer, and under normally encountered operating conditions for the cir-

cuit assembly current flows between the pair of terminals along an axis of the layer, the method comprising providing, in a first, coarsest, trimming action, a first channel through the layer and extending, from one edge of the layer partially across the width of the layer, at least substantially transversely to the axis, providing through the layer, in a second, finer, trimming action, a second channel extending from the extremity of the first channel remote from the edge of the layer, and at least substantially parallel to the axis of the layer, and providing at least one further trimming action, each such further trimming action comprising providing a further channel through the layer extending at least substantially parallel to the axis of the layer, each said further channel being provided successively between the immediately previously provided channel and said one edge of the layer, there being provided successively a plurality of regions of the layer, through each of such regions a current does not flow, each such successively provided region being partially enclosed by the first channel and the immediately previously provided channel, the regions being of successively smaller breadths between said one edge of the layer and the immediately previously provided channel, each succeeding further channel extending at least partially within the region, through which a current does not flow, and partially enclosed by the first channel and the immediately previously provided channel, and in the method there being predetermined and successively greater accuracies associated with the constituent trimming actions, the magnitude of any trimming obtained in each of the successive further trimming actions being determined by the amount the corresponding further channel extends beyond the region, through which a current does not flow, and partially enclosed by the first channel and the immediately previously provided channel.

4,352,006

HEATED MIRROR, DESIGNED IN PARTICULAR TO CONSTITUTE AN EXTERNAL REARVIEW MIRROR ELEMENT FOR A VEHICLE

Bogdan Zega, Geneva, Switzerland, assignor to Societa Italiana Vetro-SIV-S.p.A., Italy

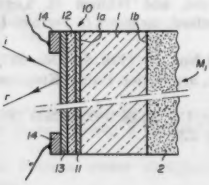
PCT No. PCT/CH80/00067, § 371 Date Feb. 7, 1981, § 102(e) Date Feb. 4, 1981, PCT Pub. No. WO80/02678, PCT Pub. Date Dec. 11, 1980

PCT Filed Jun. 3, 1980, Ser. No. 233,602

Claims priority, application Switzerland, Jun. 7, 1979, 5303/79

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—219 **9 Claims**



1. A heated mirror comprising:

a transparent substrate;

a reflective coating covering at least one of the surfaces of said substrate, said reflective coating including a stack of transparent, non-metallic layers having alternately a high index of refraction and a low index of refraction, at least one of the layers having a high index of refraction being constructed of an electrically conductive, transparent, non-metallic material and the remaining layers of said stack being constructed of transparent, dielectric materials; and

means for supplying an electrical current through said at least one electrically conductive layer to heat said mirror.

4,352,007

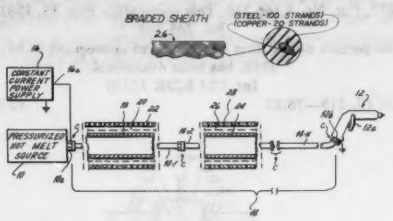
HOT MELT MULTI-SECTION HOSE HEATING SYSTEM

Robert G. Baker, Buford, and Dario J. Ramazzotti, Atlanta, both of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 22, 1980, Ser. No. 199,488

Int. Cl.³ H05B *3/58*

U.S. Cl. 219—301 **5 Claims**



1. A heating system for a hot melt hose interconnecting a source of pressurized hot melt adhesive and a dispenser, comprising:

a first hot melt hose section having:

(a) a first inner electrically nonconductive tube which is chemically inert and fluid impervious relative to hot melt adhesive which flows under pressure therethrough,

(b) a first outer electrically nonconductive sheath of thermally insulating material surrounding said first inner tube and exhibiting a specified heat loss per unit length of hose, and

(c) a first intermediate electrically conductive braided sheath between said first inner tube and first outer sheath for strengthening said first hot melt hose and providing heat thereto when supplied with an electrical current of preset magnitude to maintain the temperature within said first inner tube at a predetermined value, said first braided sheath having N strands of relatively high resistance wire of diameter d;

a second hot melt hose section having:

(a) a second inner electrically nonconductive tube which is chemically inert and fluid impervious relative to hot melt adhesive which flows under pressure therethrough,

(b) a second outer electrically nonconductive sheath of thermally insulating material surrounding said second inner tube and exhibiting substantially less heat loss per unit length of hose than said specified heat loss of said first outer sheath,

(c) a second intermediate electrically conductive braided sheath between said second inner tube and said second outer sheath for strengthening said second hot melt hose and providing heat thereto when supplied with an electrical current of said preset magnitude to maintain the temperature within said second inner tube at said predetermined value notwithstanding said substantially less heat loss of said second outer sheath, said second braided sheath having N-M strands of relatively high resistance wire of diameter d and M strands of relatively low resistance wire of diameter d, said N-M strands and said M strands of said second braided sheath collectively dissipating, when input with electrical current of said preset magnitude, substantially less electrical power per unit length of hose than said N strands of said first braided sheath consistent with the substantially improved heat loss characteristics of said second outer thermally insulating sheath relative to said first outer thermally insulating sheath, said first and second braided sheaths having substantially the same flexibility and strength;

means for interconnecting said first and second hot melt hose sections in series between said hot melt source and

said dispenser with said first and second inner tubes communicating for hot melt flow therethrough and with said first and second braided sheaths in electrical series for passage therethrough of a common electrical current; and an electrical power supply across which said first and second braided sheaths are connected in electrical series for passage therethrough of said common electrical current.

4,352,008
ELECTRIC HEATING DEVICE FOR HEATING THE INTERIOR OF A SWITCH CABINET

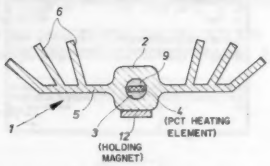
Edwin Höfer, Bellheim, and Helmut Ohnmacht, Kandel, both of Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,784

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2902090

Int. Cl.³ H05B *3/50*; F24H *7/06*; F28F *1/16*

U.S. Cl. 219—540 **8 Claims**



1. A heating device for warming the interior of a cabinet containing electrical apparatus, said heating device comprising at least one PTC electrical resistance heating and temperature regulating device which is situated in the interior of a body made of thermally conductive material that is connected in a thermally conductive manner to a radiator, said radiator comprising a pair of flat base plates projecting from opposite sides of said body and radiator fins extending only from said base plates and only outwardly from one flat side thereof, wherein said body is a massive hollow element having a wall thickness greater than that of said base plates and fins and a height substantially greater than the wall thickness of said base plates, and wherein said body, base plates and fins are unitarily formed as a one piece extrusion.

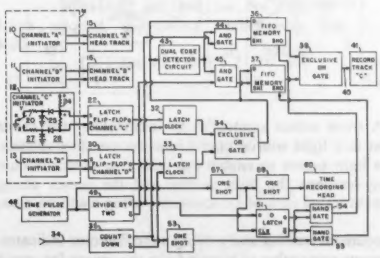
4,352,009
VARIABLE RATIO TOTALIZER

Robert E. Dyer, and Murray C. Carney, both of Dunwoody, Ga., assignors to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jan. 8, 1979, Ser. No. 1,872

Int. Cl.³ G06M *3/08*; G11B *5/00*

U.S. Cl. 235—92 ST **7 Claims**



1. In apparatus for recording data signals from first and second sources on a single channel, each source generating a signal representative of a measured event, said apparatus further including a source of periodic timing signals for defining successive time intervals, the combination comprising: input circuit means for receiving the output signals of said first and second sources and delaying the signals of one source relative to the other, first combining circuit means responsive to said input circuit means for generating a train of data signals representative of the combined signals from said sources; first and second memory circuit means, each having a data input connected to an output of said first combining circuit means for receiving data signals and being adapted to store said data signals sequentially in response to shift-in signals, and to sequentially shift stored data signals to an output in response to shift-out signals; a source of clock signals; memory select circuit means responsive to said clock signals and to said timing signals for generating shift-in signals for storing the output signals of said first combining circuit means in said first and second memory circuit means in alternate time intervals; delay timer circuit means for generating delayed timing signals; shift signal generating means responsive to said clock signals and to said delayed timing signals for generating shift-out signals for shifting the data signals stored in said first or second memory circuit means to respective outputs of said first and second memory circuit means in the same time interval in which said data signals are entered into an associated one of said memory circuit means but delayed relative to the time at which said data signals are entered into the associated memory circuit means; second combining circuit means connected to the outputs of said first and second memory circuit means for receiving the data of said first and second memory circuit means in alternate time intervals and generating a train of output signals representing the combined outputs of said first and second memory circuit means, and recording means for recording the output signals of said second combining circuit means on a first track and for recording said delayed timing signals on a second track in timed relation with the recording of signals on said first track such that successive recorded delayed timing signals indicate successive time intervals during which the recorded events occurred.

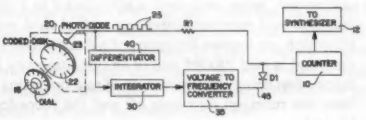
4,352,010
VARIABLE RATE TUNING FOR RADIO TRANSMITTERS AND RECEIVERS

Steven C. Koogler, Dayton, Ohio, assignor to R. L. Drake Company, Miamisburg, Ohio

Filed Feb. 13, 1980, Ser. No. 121,086

Int. Cl.³ G06M *3/14*

U.S. Cl. 235—92 EV **6 Claims**



1. A variable rate tuning circuit including

a manually rotatable dial,

means responsive to the rotation of the dial for producing first pulses directly proportional to the amount of dial rotation,

a frequency determining counter,

means responsive to said first pulses and the direction of dial rotation for incrementing and decrementing said counter, and

further means responsive to said first pulses for providing additional pulses for incrementing and decrementing said counter, the rate said additional pulses are produced being related to the rate said first pulses are produced,

whereby the amount said counter is incremented or decremented with respect to the amount of dial rotation is a function of the speed at which said dial is rotated.

4,352,011

SUBSCRIPTION CARD FOR A VIDEOTEX RECEIVER

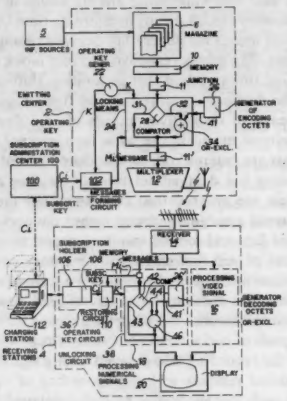
Louis C. Guillou, Bourgbarre-Saint Erblon, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre Nationale d'Etudes des Telecommunications), Issy les Moulineaux, both of, France

Filed Jan. 23, 1980, Ser. No. 114,515

Claims priority, application France, Feb. 6, 1979, 79 02996

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—375 **1 Claim**



1. A subscription card, comprising:

a central unit constituted by an arithmetical and logical unit and a control unit governing said arithmetical and logical unit,

a Programmable Read Only Memory (PROM),

a Random Access Memory (RAM) acting as a working memory,

a Read Only Memory (ROM) containing instructions for:

(i) recording numerical subscription keys C_i in said Programmable Read Only Memory when said card is inserted in a charging station deliverying said subscription keys Ci,

(ii) carrying out, in said arithemetical and logical unit, a calculation, when said card is introduced in a videotex receiver, said receiver delivering to said card messages Mi which are known functions of subscriptions keys Ci recorded in said PROM and of an operating key K, said calculation being the restoration of said operating key K from the received messages Mi and the recorded keys Ci, and

an interface for exchanging signals defining subscription keys Ci, messages Mi and operating key K, between said card and said charging station and between said card and said receiver.

4,352,012

HEADER SHEET FOR IMAGE COMMUNICATIONS SYSTEM

Joseph A. Verderber, 315 S. Valley Rd.; James A. Fortcamp, 162 Harbor Rd., both of Barrington, Ill. 60010; Ace McInturff, 2401 Simpson, Evanston, Ill. 60201, and Denis A. Rose, 1429 Wolftrap Run Rd., Vienna, Va. 22180

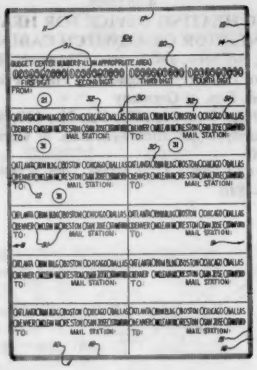
Filed Feb. 22, 1980, Ser. No. 123,577

Int. Cl.³ G06R *19/00*

U.S. Cl. 235—487 **10 Claims**

1. A document header sheet for an image communication transmission system having means for scanning successive document sheets in a raster of successive spaced substantially parallel lines, said header sheet having:

(a) a peripheral border, said border having a similar marking pattern along each edge of the sheet identifying said sheet as a header sheet when scanned by said scanning means, and variations in said pattern to identify the edge of such sheet that is the leading edge relative to said raster and;



(b) specific marking areas within said peripheral border designed for identifying a pre-determined data group for communicating information to the image communication transmission system; and

(c) marking areas designated for identifying predetermined addressee stations, and means responsive to the detection of a marking in said areas in relation to the position of scan in the raster for generating a signal indicative of one of said addressee stations.

4,352,013

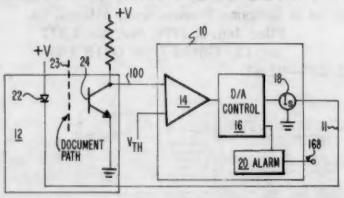
TRACK SENSOR CONTROLLER

Harold A. Fasig, Plymouth, and Eugene E. Paananen, Brighton, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 2, 1980, Ser. No. 155,053

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 R **7 Claims**



1. A track sensor controller for controlling the excitation current to a light source operable in cooperative relationship with a light sensor to enable the sensor to detect documents passing between the light source and the sensor along the document travel path of a document sorting machine, comprising:

a document leading and trailing edge detector indicates first means responsive to signals from the sensor for providing further signals of use in preventing false indications that a document has passed beyond an area monitored by the sensor, where the false indications are caused by light passing through holes, or other light transmitting areas, in a document;

said first means including means for comparing signals from

the sensor and signals from a source of first reference values to derive signals indicating whether documents are present;

said first means including means for receiving programmed input signals for use in establishing signals of use in preventing a false indication that the trailing edge of a document has passed when, in fact, the edge of a hole has passed;

said first means employing said derived signals together with said received programmed input signals to generate hole-look-through signals of use in preventing false indications that a document has passed the sensor; and

second means responsive to signals from the sensor and signals from the first means for providing control signals to a current source coupled to maintain the average intensity of the light source at a preselected value.

4,352,014

SAMPLER AND CELL FOR RADON DETECTORS AND METHOD OF USING SAME

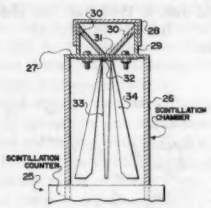
Brian Powell, 221-29th St. West, Saskatoon, Saskatchewan, Canada (S7L 0L8)

Filed Mar. 6, 1980, Ser. No. 127,906

Claims priority, application United Kingdom, Jun. 1, 1979, 7919214

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—253 **11 Claims**



1. A method of sampling radon gas consisting of the steps of placing an acetate sampling strip in the path of the radon gas and maintaining same in position for a predetermined time interval, inserting said sampling strip into a scintillation cell and operatively connecting said cell to a scintillation counter to read the alpha emissions from said sample strip.

4,352,015

ANTI-CONTAMINATION DIAPHRAGM FOR AN ELECTRON BEAM APPARATUS

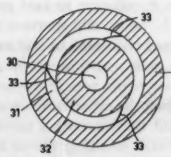
Alfred Jore; Gerardus G. P. Van Gorkom, and Nicolaas H. Dekkers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,712

Claims priority, application Netherlands, Sep. 5, 1979, 7906633

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—311 **8 Claims**



1. In an electron beam apparatus comprising an electron source for generating an electron beam, an electron-optical lens system arranged along an electron optical axis for transmitting said electron beam, and anti-contamination means for reducing object contamination, the improvement comprising said anti-contamination means including a composite diaphragm arranged about said electron optical axis, said composite diaphragm transmitting a paraxial portion of said electron beam to an object plane and forming a non-paraxial portion of said electron beam annularly surrounding said paraxial portion on said object plane, said non-paraxial portion preventing contamination of the object.

4,352,016

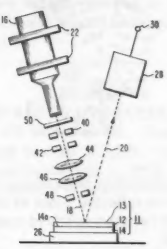
METHOD AND APPARATUS FOR DETERMINING THE QUALITY OF A SEMICONDUCTOR SURFACE

Michael T. Duffy, Princeton Junction, and Peter J. Zanzucchi, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,348

Int. Cl.³ G01N *23/00*; G01T *1/22*; G01J *1/42*

U.S. Cl. 250—358.1 **7 Claims**



1. A method of determining the surface quality of a semiconductor material comprising:

(a) exposing said semiconductor surface to a first beam of radiation of a first wavelength from a source of radiation at a preselected angle of incidence so that a portion of said first beam is reflected from said surface;

(b) measuring the intensity of said reflected beam to obtain a first intensity signal;

(c) thereafter exposing said semiconductor surface to a second beam of radiation from said source at said angle so that a portion of said second beam is reflected from said surface, said second beam having a wavelength different from the wavelength of said first radiation beam, the wavelength of one of said beams being in the ultra-violet spectrum region wherein the influence of crystal lattice disorder of the material on reflectance is significantly greater than the influence of crystal lattice disorder on reflectance of said material at the other wavelength;

(d) measuring the intensity of said second reflected beam to obtain a second intensity signal; and

(e) comparing said first intensity signal with said second intensity signal to determine the difference between the two signals, the magnitude of said difference being a measure of quality of said semiconductor material.

4,352,017

APPARATUS FOR DETERMINING THE QUALITY OF A SEMICONDUCTOR SURFACE

Michael T. Duffy, Princeton Junction; John F. Corboy, Jr., Ringoes, and Peter J. Zanzucchi, Lawrenceville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,356

Int. Cl.³ G01N *23/00*; G01T *1/22*; G01J *1/42*

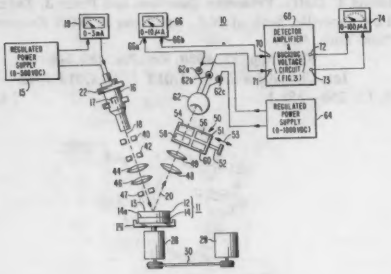
U.S. Cl. 250—358.1 **12 Claims**

1. Apparatus for determining the surface quality of a semiconductor material comprising:

(a) means for exposing said semiconductor surface to a first

beam of radiation of a first wavelength from a source of radiation at a preselected angle of incidence so that a portion of said first beam is reflected from said surface;

(b) means for exposing thereafter said semiconductor surface to a second beam of radiation from said source at said angle having a second wavelength different from said first radiation so that a portion of said second beam is reflected from said surface, the wavelength of one of said beams being in the ultra-violet spectrum region wherein the influence of crystal lattice disorder of the material on reflectance is significantly greater than the influence of crystal lattice disorder on reflectance of said material at the other wavelength;



(c) means for determining, in sequence, the intensity respectively, of the first reflected beam to obtain a first intensity signal, and of the second reflected beam to obtain a second intensity signal;

(d) means for comparing said first intensity signal with said second intensity signal to provide information indicative of the difference between the first and second intensity signals, the difference between said signals being a measure of quality of said semiconductor material; and

(e) means for providing sufficient resolution for comparing very small differences in said first and second intensity signals.

4,352,018

APPARATUS FOR PERFORMING POSITRON EMISSION COMPUTED TOMOGRAPHY

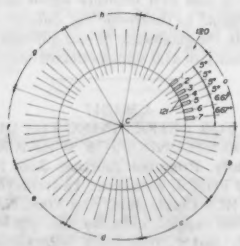
Eiichi Tanaka, Mitaka; Norimasa Nohara, Chiba; Takehiro Tomitani, Chiba; Mikio Yamamoto, Chiba; Kenji Ishimatsu, Abiko, and Katsumi Takami, Tokyo, all of Japan, assignors to National Institute of Radiological Sciences, Chiba and Hitachi Medical Corporation, Tokyo, both of, Japan

Filed Mar. 25, 1980, Ser. No. 133,895

Claims priority, application Japan, Mar. 30, 1979, 54-36860

Int. Cl.[3] G01T *1/20;* G01N *21/00*

U.S. Cl. 250—363 S **5 Claims**



1. An apparatus for performing positron emission computed tomography, comprising:

n revolvable detector arrays where n is an odd number equal to at least three, each array including a plurality of detectors where there is a fixed spacing between each detector of each array and the remaining detectors of the array,

each array containing at least one detector disposed at an irregular position relative to other detectors in said array,

said n revolvable detector arrays being successively arranged around a center of revolution where each array has an adjacent array on each side of it and where the relative locations of the detectors with respect to each other are the same for each array so that, for each revolution of the n detector arrays through an angle of 360°/n, the detectors of each array will assume respectively positions previously assumed by the detectors of one of its adjacent arrays.

4,352,019

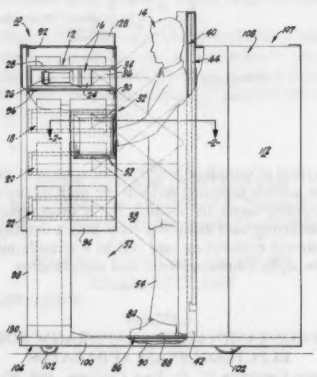
IN-VIVO RADIATION COUNTER

David E. Pollard, Livermore, Calif., assignor to Helgeson Nuclear Services, Inc., Pleasanton, Calif.

Filed Jun. 6, 1980, Ser. No. 156,921

Int. Cl.[3] G01J *1/42*

U.S. Cl. 250—394 **6 Claims**



1. A radiation counter for a body utilizing means for determining an aspect of radiation emanating from the body comprising:

a. means for detecting radiation from specific areas of the body, including a multiplicity of radiation detectors proximately spaced from one another;

b. aperture means for forming a corridor for permitting access of selected radiation to said means for detecting radiation from the body, said aperture means including an aperture associated with each of said multiplicity of radiation detectors, each aperture permitting the access of radiation from a specific area of the body;

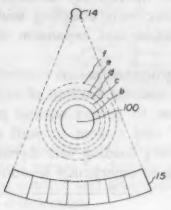
c. means for shielding the corridor from passage of radiation therethrough and to said means for detecting radiation from the body, said shielding means being located such that the body lies between said aperture means and said shielding means; and

d. means for isolating a portion of the body including a rest for restricting movement of a selected portion of the body, said rest being located outside said corridor.

4,352,020
METHOD AND APPARATUS FOR EXAMINING A SUBJECT

Isao Horiba, Nagoya; Shigenobu Yanaka, Kashiwa; Yasuo Kuwabara, Kashiwa, and Kouichi Koike, Kashiwa, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,088
Claims priority, application Japan, Jan. 11, 1979, 54-989
Int. Cl.³ A61B *6/00*
U.S. Cl. 378—18 **12 Claims**



1. A tomography system, comprising an X-ray source and X-ray detectors disposed opposite to said source, an examinee to be placed in the measuring path interposed between said X-ray source and detectors; an emission of X-rays from said source, the X-rays, having penetrated through the examinee, being detected by said X-ray detectors to obtain measurements of X-ray absorption through the examinee from the detected values, which system is characterized by:

a plurality of disk-shaped standard phantoms of different radii which are set one by one in the examinee measuring position in said measuring path in such a manner that the disk surface forming the circumference of each phantom coincides with the plane of X-ray scan;

first memory to store X-ray absorption, for each standard phantom, obtained from the values, detected by said detectors, of X-ray having penetrated through said standard phantom after irradiated from said source to said phantom;

second memory to store theoretical X-ray absorption, for each standard phantom, obtained based on said each of the standard phantoms;

X-ray absorption stored in said first memory and the theoretical X-ray absorption being used as data for compensation of the measurements of X-ray absorption from said examinee.

4,352,021
X-RAY TRANSMISSION SCANNING SYSTEM AND METHOD AND ELECTRON BEAM X-RAY SCAN TUBE FOR USE THEREWITH

Douglas P. Boyd, Woodside; William B. Herrmannsfeldt, Los Altos; James R. Quinn, San Jose, and Robert A. Sparks, Palo Alto, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 7, 1980, Ser. No. 109,877
Int. Cl.³ A61B *6/00*; H01J *35/00*
U.S. Cl. 378—12 **14 Claims**

1. In an x-ray transmission scanning system an electron beam scan tube for providing a plurality of adjacent movable x-ray sources comprising:

an evacuated envelope having a longitudinal axis;

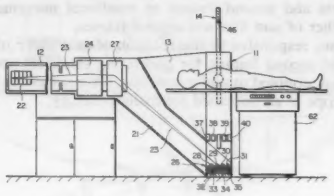
an electron gun disposed axially at one end of the envelope projecting an electron beam along said axis;

a focus coil spaced from said gun to receive and focus said beam;

a plurality of adjacent longitudinally spaced curvilinear elongated targets disposed at the other end of said envelope to receive the electron beam and generate x-rays in response thereto;

means for moving said focused electron beam along said targets and from one target to another; and

a source collimator having an elongated slot disposed adjacent to each of said elongated targets to intercept said x-rays and provide an x-ray beam which fans outwardly

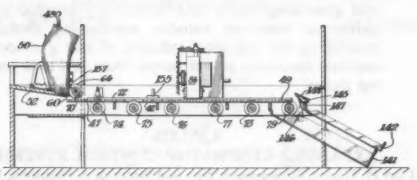


from the received electron beam to form a fan shaped beam which rotates as the electron beam is moved along the corresponding target whereby to scan a plurality of adjacent longitudinally spaced sections at least one for for each of said targets.

4,352,022
READING OF MARKS

Charles W. Britton, 301 Tavistock Dr., Medford, N.J. 08055

Continuation-in-part of Ser. No. 675,628, Apr. 9, 1976, Pat. No. 4,228,952. This application Aug. 6, 1979, Ser. No. 63,736
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—561 **3 Claims**



1. An automatic sheet reading assembly comprising an elongated bed along which sheets are moved, sheet-transporting means including a powered feed roller adjacent one end of the bed for engaging the end sheet in a sheet supply pack and rotating in one direction to propel that sheet into the bed, the sheet-transporting means also including sheet-spacing means connected to interrupt the actuation of the feed roller after a transported sheet is disengaged from that roller, to keep the next sheet from being transported into the bed until it is spaced from the previous sheet.

4,352,023
MECHANISM FOR GENERATING POWER FROM WAVE MOTION ON A BODY OF WATER

Herbert K. Sachs, 2551 Ivanhoe Dr., Orchard Lake, Mich. 48033, and George A. Sachs, 1845 Woodland, Sylvan Lake, Mich. 48053

Filed Jan. 7, 1981, Ser. No. 223,120
Int. Cl.³ F03B *13/12*; H02P *9/04*
U.S. Cl. 290—42 **33 Claims**

1. A mechanism for generating power from wave motion in a body of water comprising:

a buoyant body adapted to float in said body of water and be partially immersed therein, said buoyant body being pivotally movable in response to said wave motion;

a gyro-wave energy transducer mounted to said buoyant body, said gyro-wave energy transducer comprising:

a gimbal including first and second frames, said first frame being pivotally mounted to said second frame for rotation

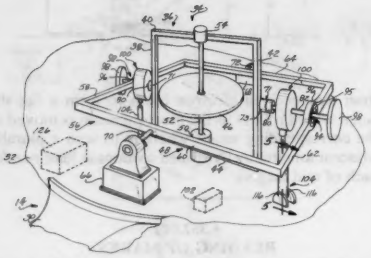
about a first axis, said second frame being pivotally mounted to said buoyant body for rotation about a second axis perpendicular to said first axis;

a gyroscope mounted to said first frame for rotation about a third axis perpendicular to said first and second axes;

means for transferring rotational movement of one of said first and second frames to rotational movement of the other of said first and second frames;

means, responsive to the rotation of said other of said first and second frames, for generating electrical power;

means, coupled to said gyroscope, for maintaining said gyroscope at a controlled rotational velocity;



electrical power storage means, connected to said generating means and to said gyroscope rotational velocity maintaining means, for storing and releasing electrical power; and

means, responsive to the time rate of change of current from said generating means and operatively coupled to said gyroscope rotational velocity maintaining means, for controlling the rotational velocity of said gyroscope to maintain maximum power output from said said generating means.

4,352,024

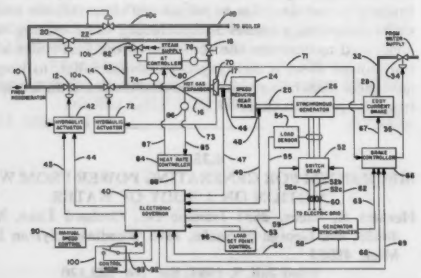
EXPANDER-GENERATOR CONTROL SYSTEM

Carl H. Geary, Greensburg, Pa., and Norman A. Samurin, Houston, Tex., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 4, 1981, Ser. No. 260,231

Int. Cl.³ F02G *3/00*

U.S. Cl. 290—52 **12 Claims**



1. A system for recovering power from a relatively high temperature waste heat fluid comprising:

waste heat fluid supply means;

expansion means connected to said supply means for receiving said relatively high temperature waste heat fluid;

electrical power generating means operatively connected to said expansion means and operated thereby as a result of the expansion of said fluid in said expansion means;

governor means;

valve means located in said supply means upstream of said expansion means and operatively connected to said governor means for opening and closing in response to signals from said governor means;

means for sensing the rotational speed of said expansion means and for transmitting a signal indicative thereof to said governor means;

means for sensing the load on said electrical power generating means and for transmitting a signal indicative thereof to said governor means;

dynamic power absorbing means;

coupling means operatively connected to said governor means for selectively coupling said dynamic power absorbing means to said expansion means to place a load thereon;

whereby said governor means controls the position of said valve means and the loading of said dynamic power absorbing means to permit normal starting, stopping and operation of said system as well as closing said valve means and fully loading said dynamic power absorbing means during an emergency shutdown of said system.

4,352,025

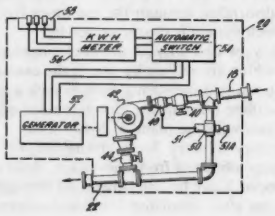
SYSTEM FOR GENERATION OF ELECTRICAL POWER

Harry D. Troyen, 351 N. 5th St., Reading, Pa. 19606

Filed Nov. 17, 1980, Ser. No. 207,274

Int. Cl.³ F03B *13/00*

U.S. Cl. 290—54 **1 Claim**



1. Apparatus for generating electricity, comprising:

a high-rise building waste water conduit system for delivering waste water from the interior of a high-rise building to an external waste water disposal sewer line;

a hydroelectric generator of electrical power installed in said waste water conduit system for generating electrical power in response to the flow of water from said conduit system to said sewer line wherein said apparatus comprises a bypass conduit containing a normally-closed type of valve, in parallel with said hydroelectric generator, and means responsive to the rate of flow of said water through said generator for opening said valve progressively further as said flow rate rises above a selected value.

4,352,026

MULTI-PHASE CURRENT BALANCING COMPENSATOR

Donald W. Owen, 334 Foreman Ave., Norman, Okla. 73069

Filed Jun. 26, 1978, Ser. No. 919,225

Int. Cl.³ H02J *3/26*

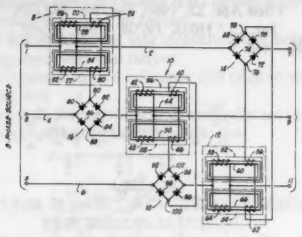
U.S. Cl. 307—14 **17 Claims**

1. Apparatus for automatically balancing the magnitudes of a plurality of alternating electrical currents carried by respective electrical conductors comprising:

a plurality of control means, each of which is connected to a separate one, and only one, of said conductors, for converting the respective alternating current carried thereby into a control signal; and

a plurality of variable reactance means, each of which is connected to a separate one, and only one, of said control

means and to a separate one, and only one, of said conductors other than that conductor to which the respective separate one of said control means is connected, for changing the reactance in the respective conductors responsive to control signals from the respective separate ones of said control means to thereby automatically and without presetting control said alternating current in each of said electrical conductors.

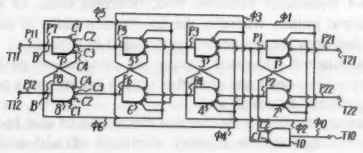


4,352,027

SHIFT REGISTER

Masayuki Miyake; Takeo Sekino, and Masashi Takeda, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1980, Ser. No. 156,209
Claims priority, application Japan, Jun. 5, 1979, 54/70300
Int. Cl.³ G11C *19/28*
U.S. Cl. 307—221 R **2 Claims**



1. A shift register comprising: a plurality of flip-flop stages connected in series, a means for supplying clock pulses to the last stage; and a means for applying an AND output of each stage to its preceding stage as a clock signal whereby input data are transferred according to clock states at said stages, in which at least one stage has a pair of gates each having at least four output terminals, one is connected to an input terminal of the pair gate, another to an input terminal of a gate in a following stage, the other two to input terminals of gates in a preceding stage with output terminals of said pairs of gates constituting AND circuits, respectively, to convey said clock pulses in the reverse direction.

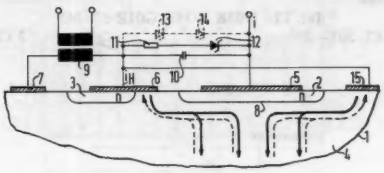
4,352,028

CIRCUIT ARRANGEMENT FOR REDUCING THE RECOVERY TIME OF A THYRISTOR COMPRISING R-C-D NETWORK BETWEEN AUXILIARY AND MAIN EMITTERS

Peter Voss, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 2,209, Jan. 9, 1979, abandoned. This application May 15, 1981, Ser. No. 264,140
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1978, 2801722
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—252 A **5 Claims**

1. Circuit arrangement for reducing the recovery time of a thyristor formed with a semiconductor body having a surface, at least one emitter zone, an emitter electrode contacting the surface of the semiconductor body exclusively at and within the confines of the emitter zone, at least one auxiliary emitter zone and a base zone, an auxiliary emitter electrode contacting the auxiliary emitter zone and the base zone, comprising a capacitor electrically connecting the emitter electrode with the auxiliary emitter electrode and a series connection of a resistor and a diode connected in parallel with said capacitor,



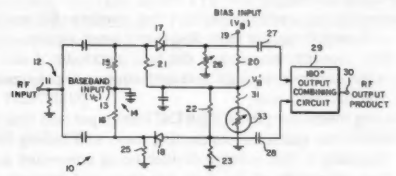
said diode having a lower threshold voltage, than that of an inputed diode formed by the emitter zone and the base zone of the thyristor, said diode of said series connection being poled with respect to the emitter electrode in the same sense as is said inputed diode of the thyristor.

4,352,029

SIGNAL PROCESSING CIRCUITRY

Paul F. Mahoney, Brighton, and Jerrold L. Bonn, Waltham, both of Mass., assignors to Signatron, Inc., Lexington, Mass.

Filed Dec. 13, 1979, Ser. No. 103,347
Int. Cl.³ H03K *3/26*; G06G *7/16*
U.S. Cl. 307—317 R **10 Claims**



1. Signal processing circuitry for processing a first input signal and a second input signal, said circuitry comprising

first and second current controllable resistance means, each having a first and a second terminal;

input circuit means for supplying said first input signal to one of said first and second terminals of said first current controllable resistance means and to one of said first and second terminals of said second current controllable resistance means;

said input circuit means further supplying said second input signal to one of said first and second terminals of said first current controllable resistance means and to the other of said first and second terminals of said second current controllable resistance means;

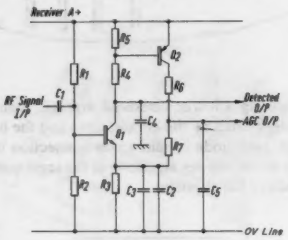
bias circuit means for applying the same bias voltage input to the same selected one of said first and second terminals of each of said first and second controllable resistance means;

output circuit means responsive to the signal at the terminal of said first current controllable resistance means opposite to the one at which said first input signal is supplied and responsive to the signal at the terminal of said second current controllable resistance means opposite to the one at which said first input signal is supplied for combining said signals to produce an output signal which is the product of said first input signal and said second input signal.

4,352,030
PULSE DETECTORS

Graham E. Beesley, Basingstoke, England, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 17, 1980, Ser. No. 130,932
Claims priority, application United Kingdom, Apr. 30, 1979, 7914882
Int. Cl.³ H03K 5/153; G01R 19/165
U.S. Cl. 307—350 3 Claims



1. A detector for detecting radio frequency input signals with varying signal levels and slowly varying carriers, comprising:

positive voltage supply line;

zero voltage supply line;

an amplifying circuit including a first transistor for receiving and amplifying the radio frequency input signals;

a first capacitor coupled to the base electrode of said first transistor for applying the radio frequency input signals to said first transistor;

biasing means for providing a DC bias to put said first transistor into quiescent conducting state, said biasing means including a first voltage divider being connected to the base electrode of the first transistor and between said positive and zero voltage lines;

resistive-capacitive means coupled between the emitter electrode of said first transistor and zero voltage supply line;

a second voltage divider coupled between the collector electrode of said first transistor and positive supply voltage line;

a second capacitor coupled between the ground and collector electrode of said first transistor;

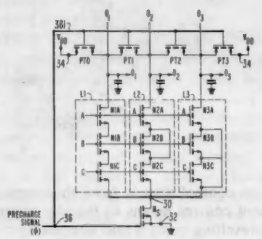
a second transistor, the base electrode of which is coupled to said second voltage divider and the emitter electrode of which is coupled to said positive voltage supply line; and

a third voltage divider connected between the emitter electrode of said first transistor and the collector electrode of the second transistor, wherein said second transistor and said third voltage divider form a feedback loop, and wherein said feedback loop coupled to said amplifying circuit adjusts the level of the DC bias applied to the amplifying circuit by said biasing means to compensate for the variation in the input signal level, whereby noise signals applied at the input of said amplifying circuit are maintained below the threshold at which said first transistor conducts and thereby renders the detector immune to false triggering due to noise and makes the detector independent of the level of slowly varying carriers of the radio frequency input signals.

4,352,031
PRECHARGE CIRCUIT

Mark D. Holbrook, Ringoes, and William K. Knapp, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1980, Ser. No. 143,025
Int. Cl.³ H03K 19/08; H01L 27/02
U.S. Cl. 307—444 9 Claims



1. In combination with N separate circuits, where N is an integer greater than 2, each circuit being connected between a different one of N output points and a common point, anim-proved precharge circuit for selectively and concurrently placing said N output points at, or close to, a selected operating potential, comprising:

N-1 transistors, each transistor having a conduction path and a control electrode;

means connecting the conductin paths of each one of said N-1 transistors between two, different ones, of said N output points, whereby the conduction paths of said N-1 transistors are connected end-to-end in series;

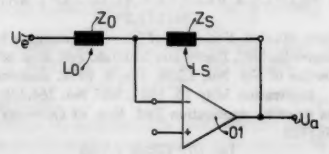
an additional transistor having its conduction path connected between one of said N output points and a point of operating potential; and

means connected to the control electrodes of said N-1 transistors and to the control electrode of said additional transistor for selectively turning them on concurrently and distributing the potential at said point of operating potential to said N output points.

4,352,032
APPARATUS FOR COMPUTING THE QUOTIENT OF TWO INDUCTANCES IN AN AUTOMOTIVE CONTROL ELEMENT POSITION SENSOR

Wolf Wessel, Oberriexingen, and Gerhard Engel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,387
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944502
Int. Cl.³ G06G 7/00
U.S. Cl. 307—515 9 Claims



1. In a motor vehicle having a control member and sensor means for furnishing a first signal indicative of the position of said control member relative to a fixed position, said sensor means comprising an iron core, a reference coil having a fixed inductance, a measuring coil, and a short-circuiting ring mov-

able with respect to said iron core for varying the inductance of said measuring coil:

apparatus for furnishing a quotient signal corresponding to the ratio of said inductance of said measuring coil to said fixed inductance, comprising

first operational amplifier means (O1) having a direct input, an inverting input and an output;

means for interconnecting said measuring coil between said inverting input and said output;

means for connecting said reference coil (Z_O) to said inverting input; and

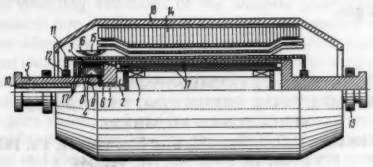
means (O2, O3) for applying a periodically increasing and decreasing voltage to said reference coil.

4,352,033

CONTACTLESS SUPERCONDUCTING SYNCHRONOUS ELECTRICAL MACHINE

Jury F. Antonov, prospekt Stachek, 83, kv. 12; Igor A. Glebov, prospekt Smirnova, 24, korpus 3, kv. 52, and Valentin N. Shakhtarin, prospekt Metallistov, 14, kv. 6, all of Leningrad, U.S.S.R.

Filed Jul. 22, 1980, Ser. No. 171,177
Int. Cl.³ H02K 9/19
U.S. Cl. 310—52 **1 Claim**



1. A contactless superconducting synchronous electrical machine comprising: a rotatable shaft; a superconducting excitation winding affixed to said rotatable shaft; an annular former affixed to said shaft in coaxial relation with said superconducting excitation winding; a superconducting armature winding implemented in the form of a cylindrical sheating and affixed to a cylindrical surface of said annular former; at least one magnetizing superconducting annular coil affixed to said shaft in axial relation with said former, in the vicinity of an end face of said former; a cryostat affixed to said shaft and surrounding said superconducting field winding, said annual former, said armature winding, and the magnetizing coil; said cryostat with said elements surrounded by said cryostat constituting a rotor of said machine; an annular stator located in axial relation with said rotor; a stationary annular core installed in concentrical relation with said armature winding; a multiphase winding on said annular core; said cryostat having a portion of a vacuum shell, within a gap between the annular core and the superconducting armature winding, made of dielectric material.

4,352,034

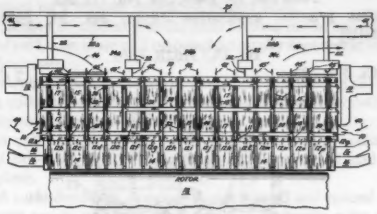
STATOR CORE WITH AXIAL AND RADIAL COOLING FOR DYNAMOELECTRIC MACHINES WTH AIR-GAP STATOR WINDINGS

Barry L. Karhan, Ballston Lake, and James B. Archibald, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,627
Int. Cl.³ H02K 9/00
U.S. Cl. 310—59 **8 Claims**

1. A gas-cooled stator core for a dynamoelectric machine, especially a machine exhibiting a high air-gap magnetic flux, said core comprising:

a plurality of annular modules each including a plurality of laminations arranged coaxially, the exterior surfaces of boundary laminations of said modules possessing radially oriented struts and circumferential struts affixed to the planar surfaces thereof so as to maintain an axial separation between said modules, said modules also possessing axially directed passages therethrough, said passages being similarly arranged in each module so as to permit partial axial gas flow through said core;



means for selectively coupling less than all of said adjacently aligned passages in adjacent modules; and

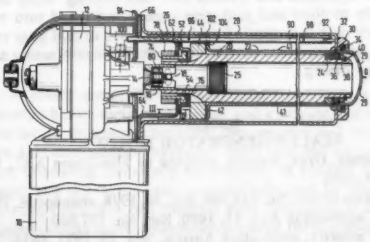
means for selectively closing other passages to provide combined partial circumferential, partial axial and partial radial gas cooling flow paths through said core.

4,352,035

ELECTRIC MOTOR OPERATED ADJUSTING DRIVE

Wilhelm Zirps, Hemmingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,295
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 7929780[U]
Int. Cl.³ H02K 7/06
U.S. Cl. 310—80 **19 Claims**

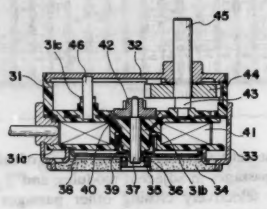


1. An electric motor operated adjusting drive, comprising a housing having an opening; a threaded rotary spindle arranged in said housing and having an axis; an adjusting nut arranged on said spindle axially displaceable and non-rotatable; an adjustment member arranged in said housing and sealed relative to the latter, said adjustment member being actuated by said adjusting nut so as to displace linearly outwardly of said housing through said opening, said adjustment member being formed by a hollow body which is thin-walled and surrounds said threaded spindle; means for sealing said adjustment member inwardly relative to said threaded spindle; and means for sealing said adjustment member outwardly relative to said opening of said housing.

4,352,036
ELECTRICAL ROTARY MACHINE

Tomohisa Kuwako, Anjo, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 25, 1980, Ser. No. 172,283
Claims priority, application Japan, Jul. 27, 1979, 54-103023[U]
Int. Cl.³ H02K 7/10
U.S. Cl. 310—83 7 Claims



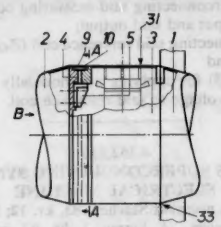
1. An electrical rotary apparatus which comprises:
a motor case of magnetic material;
a stator member forming part of said case;
a rotor member within said case, one of said members having a permanent magnet and the other member being of a magnetic material;
a rotor shaft on which said rotor member is mounted;
a bearing of a synthetic resin material in which said rotor shaft is supported;
a coil bobbin of synthetic resin material around said shaft and on the opposite side of said rotor from said stator;
a ring coil wound around said coil bobbin;
a yoke member of magnetic material extending parallel with said rotor shaft from said rotor and then radially outwardly on the opposite side of said bobbin coil from said rotor;
a reduction mechanism including reduction gears and a further gear secured to said rotor shaft at a point spaced along said shaft from said rotor and on the opposite side of said bearing from said rotor and engaged with said reduction gears;
and
a gear case of synthetic resin material for said reduction gears and having a radially extending wall within which said radially extending part of said yoke is embedded; said gear case, said coil bobbin and said bearing being integrally molded and said gear case being fitted into said motor case for securing said motor case to said gear case and with the outer periphery of said yoke contacting said motor casing.

4,352,037
SEALED GENERATOR HOUSING

Fritz Santner, Graz, Austria, assignor to Elin-Union A.G., Vienna, Austria

Continuation of Ser. No. 943,946, Sep. 20, 1978, abandoned. This application Aug. 11, 1980, Ser. No. 177,000
Claims priority, application Austria, Sep. 23, 1977, 6825/77
Int. Cl.³ H02K 5/00
U.S. Cl. 310—89 6 Claims

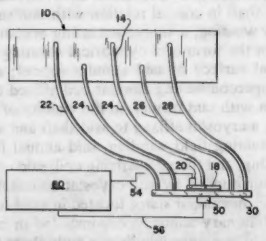
1. A sealing housing, particularly of a submerged fluid-powered generator
comprising, in combination
a turbine housing,
a substantially cylindrical generator stator frame disposed upstream of said turbine housing, being sealingly connected thereto, and forming therewith a first housing component, said generator stator frame having an axial bore,
a cupola-shaped part disposed upstream of said generator stator frame,
a plurality of centering segments being secured to said cupola-shaped part and forming therewith a second housing component, said centering segments being slidable on the surface of said axial bore,
a gap being defined between said cupola-shaped part and said generator stator frame, so as to permit relative axial displacement between said first and second housing components due to thermally caused expansion or contraction, and means for sealing said gap near the periphery of said generator stator frame and said cupola-shaped part exteriorly substantially flush with the portions of said cupola-shaped part and of said generator stator frame adjacent said gap.



4,352,038
ACOUSTICAL TRANSMISSION WAVE GUIDE ASSEMBLY FOR PREDICTING FAILURE OF STRUCTURED MEMBERS

Neal S. Moreton, R.D. 5, Box 292, East Stroudsburg, Pa. 18301

Filed Feb. 19, 1980, Ser. No. 122,044
Int. Cl.³ H01L 41/08
U.S. Cl. 310—323 12 Claims

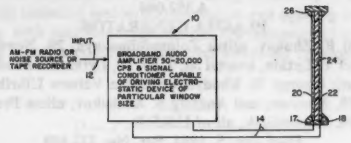


1. An acoustical transmission wave guide assembly for detecting acoustical energy emitted by structural members under adverse stress conditions, comprising:
(a) a thin elongated metal wave guide having a smooth uninterrupted surface free from scratches along which such acoustical energy may travel,
(b) a member having a monitored surface along which acoustic energy emitted by crystal slippage under adverse stress conditions is carried,
(c) one end of the wave guide being rigidly connected to the monitored surface so as to permit the acoustical energy to pass from the monitored surface to the smooth surface of the wave guide along which it travels,
(d) the other end of the wave guide being rigidly attached to a sensing plate such that the acoustical energy carried along the smooth surface of the wave guide is received,
(e) a piezo electric transducer sensitive to such acoustical energy frequencies being attached to the sensing plate, and
(f) protecting means disposed around and spaced from the wave guide transmitting surface to preclude damage to the surface and introduction of spurious acoustical impulses.

4,352,039
SONIC TRANSDUCER

Jerry W. Hagood, and Ralph L. Norman, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1980, Ser. No. 172,360
Int. Cl.³ H04R *19/00*
U.S. Cl. 310—328 **1 Claim**

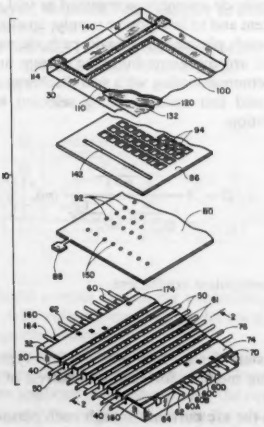


1. A sonic transducer device comprising a broad band amplifier having an input which is fed sonic vibration signals selected from those produced from music, singing, speech and/or noise, said broad band amplifier producing an output which is fed through output leads to an electrical transducer which produces vibrations in a window pane to put an interfering vibrating frequency on the window pane to prevent one from detecting vibrations of the window pane that can be translated into spoken words that are being spoken within a room where the window pane is mounted, said electrical transducer including a pair of electrically conductive sheets of glass that form said window pane and are mounted in an insulated housing with an elastic, transparent, insulative layer between the glass sheets, and said output leads from said broad band amplifier being electrically connected to said glass sheets to cause said glass sheets to vibrate when an output is produced at the output leads.

4,352,040
DISPLAY PANEL WITH ANODE AND CATHODE ELECTRODES LOCATED IN SLOTS OF BASE PLATE

Nicholas C. Andreadakis, Branchburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 14, 1980, Ser. No. 167,830
Int. Cl.³ H01J *17/49, 17/16*
U.S. Cl. 313—217 **3 Claims**

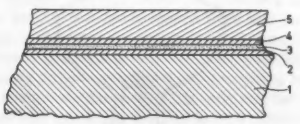


1. A display panel comprising
a gas-filled envelope made up of a base plate and a viewing face plate hermetically sealed together, said envelope having a longitudinal axis,
said base plate having a top surface, upper and lower edges lying parallel to said longitudinal axis, and left and right ends,
a plurality of first parallel longitudinal slots formed in said top surface,
an anode electrode seated in each of said slots and secured in place by a cement deposited in said slots,
a plurality of second parallel slots formed in the top surface of said base plate and oriented generally transverse to said first slots,
an insulating sealing material in each of said second slots and a cathode wire secured in place in each of said second slots by means of said sealing material,
said cathodes being all substantially uniformly positioned depth-wise with respect to the top surface of said base plate,
said cathodes being disposed transverse to and spaced from said anode wires, each crossing of an anode wire and a cathode wire defining a gas-filled cell, there being rows and columns of such cells,
a layer of insulating material on said base plate and having marginal portions extending along the upper and lower edges of said base plate and overlying all of said cathodes, said layer of insulating material having a plurality of apertures in said marginal portions thereof, said apertures overlying selected ones of said cathodes adjacent to the longitudinal edges of said base plate, and
longitudinal conductive runs on said marginal portions of said insulating layer, each conductive run making contact with different ones of said cathodes through said apertures whereby said cathodes are connected together in groups.

4,352,041
ROTARY ANODES FOR X-RAY TUBES

Horst Hübner; Bernhard Lersmacher, both of Aachen; Hans Lydtin, Stolberg, and Rolf Wilden, Roetgen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,894
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929136
Int. Cl.³ H01J *35/08*
U.S. Cl. 374—144 **6 Claims**



1. A rotary anode for an X-ray tube comprising a carbon support, a heavy metal target layer and a plurality of intermediate layers interposed between the support and the target layer, said intermediate layers including first and second outer layers consisting essentially of rhenium, in contact with the support and the target layer, respectively, and an inner layer consisting essentially of a rhenium alloy containing at least one carbide-forming metal, interposed between the first and second outer layers.

4,352,042
LUMINESCENT SCREENS FOR FLAT IMAGE DISPLAY DEVICES

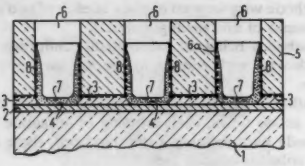
Hans P. Lorenz, Schwarzenbruck, and Rolf Wengert, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,584
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855090
Int. Cl.³ H01J *17/49, 61/42*
U.S. Cl. 313—485 **13 Claims**

1. In a luminescent screen for flat image display devices with

electron beams drawn-out of a gas discharge with an acceleration anode for such electron beams and a plurality of luminescent point surfaces separated from one another by a black bordering layer so that during operation said electron beams strike said luminescent point surfaces, the improvement comprising:

a glass screen plate positioned on the inside of said luminescent screen supports a perforated plate above said black



bordering layer, said perforated plate having a through-hole with an interior hole wall over each luminescent point surface and a light-increasing means positioned on at least portions of said hole wall adjacent and facing said glass screen plate for cooperatively interacting with said luminescent point surfaces for directing electrons reflected against said through-hole walls from the luminescent point surfaces back toward said point surfaces.

4,352,043

CATHODOLUMINESCENT LIGHT SOURCES AND ELECTRIC LIGHTING ARRANGEMENTS INCLUDING SUCH SOURCES

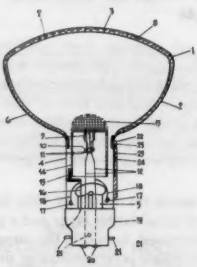
Sydney A. R. Rigden, Hemel Hempstead, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 6, 1981, Ser. No. 232,169

Claims priority, application United Kingdom, Feb. 27, 1980, 8006549; Jun. 4, 1980, 8018285

Int. Cl.³ H05B *43/00*; H01J *63/06*

U.S. Cl. 315—1 **10 Claims**



1. A cathodoluminescent light source consisting of an electric lamp which includes an evacuated bulbous glass envelope with an integral glass neck terminated by a cap, an anode constituted by an electrically conductive coating on at least part of the interior surface of the bulb wall, such that at least part of the bulb wall is light transmissive, a layer of phosphor on the whole of the interior of the bulb wall and overlying the said anode coating, which phosphor is excitable to luminescence by electron bombardment, a dome-shaped metal mesh grid located within the bulb adjacent to the junction between the bulb and neck of the envelope, and supported by a hollow metal cylinder disposed coaxially within the envelope neck, an electron emissive cathode mounted within the assembly of the grid and its supporting cylinder, which cathode is so shaped and so located within the said grid assembly that the electrons emitted from the cathode in operation of the lamp are substantially uniformly distributed over the whole of the surface of the grid on which they impinge, and electrically conducting leads connecting said anode, grid and cathode to respective contacts, the grid and cathode contacts being carried by the said cap and the anode contact being located on the exterior of the envelope neck, which contacts are adapted to be connected to a circuit arrangement for operation of the lamp from a source of electric current supply.

4,352,044

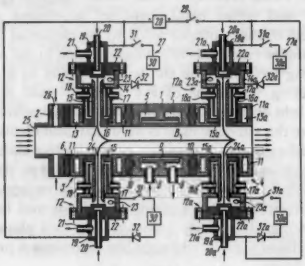
PLASMA GENERATOR

Mikhail F. Zhukov, ulitsa Zolotodolinskaya, 28, Novosibirsk; Albert Y. Lytkin, kvartal 3a, 9, kv. 19, Lytkarino Moskovskoi oblasti; Georgy N. Khudyakov, ulitsa Valtera Ulbrikhta 21, kv. 58, Moscow, and Anatoly S. Anshakov, ulitsa Pravdy, 7, kv. 16, Novosibirsk, all of U.S.S.R.

Filed Jan. 5, 1981, Ser. No. 222,648

Int. Cl.³ H05H *1/42, 1/44*

U.S. Cl. 315—111.21 **1 Claim**



1. A plasma generator comprising: a discharge chamber; a means for introducing a plasma-forming medium into said discharge chamber, installed on said discharge chamber; a cathode assembly associated with said discharge chamber and comprising at least two plasmatrons; an anode assembly associated with said discharge chamber and comprising at least two plasmatrons; a power supply; a system for initiating an arc discharge in each plasmatron; an inlet for the plasma-forming medium in each plasmatron; an end electrode in each plasmatron of said cathode assembly, connected to said arc discharge initiating system and to said power supply; an auxiliary hollow electrode in each plasmatron of said cathode assembly, connected to said arc discharge initiating system and having an exit opening communicating with said discharge chamber, the diameter of said exit opening being selected to satisfy the following relation:

$$D = A \frac{I^{\frac{2m+1}{m+1}}}{G^{\frac{m}{m+1}} \cdot U^{\frac{1}{m+1}}} (m),$$

where

m is a dimensionless coefficient;

$$m > -0.5$$

A is a constant for a given pressure and type of the plasmaforming medium for each plasmatron of said cathode assembly;

I=(I′/n) is the arc current through each plasmatron of said cathode assembly (in amperes);

I′ is the arc current through said discharge chamber (in amperes);

n is the number of plasmatrons in said cathode assembly;

G is the flow rate of the plasma-forming medium through a plasmatron of said cathode assembly (in Kg/s);

U is the voltage drop across the interval between the end

electrode of a plasmatron of said cathode assembly and the conducting portion of the electric arc in said discharge chamber near said exit opening of said auxiliary hollow electrode of the plasmatron of said cathode assembly (in volts);

said end electrode in each plasmatron of said cathode assembly being connected to said arc discharge initiating system and to said power supply; said auxiliary hollow electrode in each plasmatron of said anode assembly being connected to said arc discharge initiating system and having an exit opening communicating with said discharge system, the diameter of said exit opening being selected to satisfy the following relation:

$$D = A \frac{I^{\frac{2m+1}{m+1}}}{G^{\frac{m}{m+1}} \cdot U^{\frac{1}{m+1}}} (m),$$

where

m is a dimensionless coefficient;

$$m > -0.5$$

A is a constant for a given pressure and type of the plasma-forming mediums, for each plasmatron of said anode assembly;

I=(I′/n) is the arc current through each plasmatron of said anode assembly (in amperes);

I′ is the arc current through said discharge chamber (in amperes);

n is the number of plasmatrons in said anode assembly;

G is the flow rate of the plasma-forming medium through a plasmatron of said anode assembly (in kg/s);

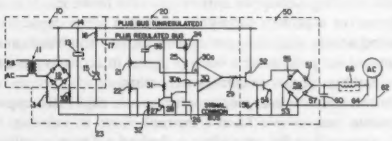
U is the voltage drop across the internal between the end electrode of a plasmatron of said anode assembly and the conducting portion of the electric arc in said discharge chamber near said exit opening of said auxiliary hollow electrode of the plasmatron of said anode assembly (in volts).

4,352,045

ENERGY CONSERVATION SYSTEM USING CURRENT CONTROL

Don F. Widmayer, Bethesda, Md., assignor to Flexiwatt Corporation, Rockville, Md.

Filed Jul. 17, 1981, Ser. No. 284,590
Int. Cl.³ H05B *41/392, 37/02*
U.S. Cl. 315—291 **20 Claims**



1. An electrical control system for controlling the current flow from an A.C. voltage supply to an electrical load device, said control system comprising:

electronic switching means, connected to said load so as to provide a controlled current path to the load, for providing for the application of substantially the entire available A.C. input voltage to the load during the initial portion of the A.C. supply voltage half wave and for switching off this input voltage at a variable point in time during said A.C. supply voltage half wave; and

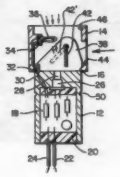
capacitor means, comprising a capacitor connected so as to provide an alternate current path to the load when said input voltage is switched off by said electronic switching means, for sustaining the current flow to the load when said input voltage is switched off by said electronic switching means.

4,352,046

NON-TACTILE SWITCH

Thomas E. Tigner, 1208 Poplar St., Nelsonville, Ohio 45764, and Charles R. Parker, 11 Blick Ave., Athens, Ohio 45701

Continuation of Ser. No. 37,027, May 8, 1979, abandoned. This application Jan. 17, 1980, Ser. No. 112,935
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—362 **12 Claims**



1. Switching apparatus for selectively energizing a load from an alternating current source comprising:

a circuit connectible with said source including solid-state switching means gateable into a conductive state to energize said load with a half-wave component of said source, a light actuable silicon controlled rectifier coupled in gating relationship with said solid-state switching means and an incandescent lamp coupled with said solid-state switching means and energizable thereby from said source simultaneously with the said energization of said load; and

housing means for retaining said circuit and having a portion opaque to light adjacent said light actuable silicon controlled rectifier, said opaque portion having an open passageway extending from an opening in said housing to said light actuable silicon controlled rectifier and having lengthwise and widthwise dimensions for attenuating diffuse ambient light incident upon said opening to an extent precluding an actuation of said light actuable controlled rectifier thereby, means for mounting said incandescent lamp at a location spaced from said passageway and aligned therewith for actuating by illumination generated thereby said light actuable silicon controlled rectifier both during positive going and negative going half cycles of said source, and an opaque flap mounted between said lamp and said opening and actuable by a current of air to move from a stable rest position to an unstable position over said opening and intermediate said opening and said lamp to effect a transient blockage of light from said lamp incident upon said opening to effect de-energization of said load.

4,352,047

SIDE PINCUSHION CORRECTING CIRCUIT FOR COLOR TELEVISION RECEIVERS

Tomoyoshi Imayasu, and Katsuo Isono, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,633
Claims priority, application Japan, Jun. 14, 1979, 54-74987
Int. Cl.³ G01S *29/70*
U.S. Cl. 315—370 **7 Claims**

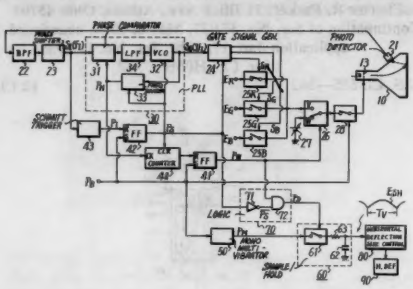
1. In a television receiver including a cathode ray tube having beam emitting means for emitting a cathode beam; display means to be scanned by said beam in a raster pattern constituted by horizontal lines, the scanning commencing for each such horizontal line in correspondence to a horizontal control pulse signal, and having at least one index stripe disposed thereon; and detector means for detecting the scanning of said index stripe by said cathode beam and generating a signal in

response to such detecting; a side pincushion correcting circuit comprising:

pulse forming circuit means for generating a reference pulse signal corresponding to the signal generated by said detector means;

phase comparator means providing an output whose magnitude depends on the difference in phase between said reference pulse signal and said horizontal control pulse signal; and

horizontal deflection circuit means supplied with the output of said phase comparator means for controlling the scanning of said cathode beam in the sense to correct for side pincushion distortion.



4,352,048

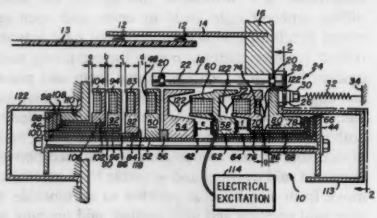
ELECTROMAGNETIC ACTUATOR APPARATUS

Dieter M. O. T. Schulze, San Jose, Calif., assignor to Ontrax Corporation, Sunnyvale, Calif.

Filed Feb. 19, 1980, Ser. No. 122,245

Int. Cl.[3] G05B *11/28*

U.S. Cl. 318—135 **27 Claims**



1. An improved electromagnetic actuator apparatus, comprising:

a plurality of connecting members each of different length arranged in an assembly by order of length from the shortest connecting member to the longest connecting member;

means for providing parallel lengthwise motion of each of said connecting members within the assembly of said connecting members;

a plurality of solenoid coil assemblies one each rigidly attached to one end of each connecting member with each solenoid coil assembly forming a magnetic circuit with the adjacent solenoid coil assembly attached to the adjacent connecting member;

a plurality of stop members with one each attached to each connecting member at the opposite end from the solenoid coil assembly attached to each of said connecting members;

means for anchoring one end of one of the shortest connecting member, said means for anchoring connected to a frame and providing a positive motion stop of said longest connecting member in a first direction parallel to the lengthwise dimension of said connecting members;

means for carriage attachment adapted to move adjacent and parallel to the lengthwise dimension of said shortest connecting member between said shortest connecting member solenoid coil assembly and said stop member;

means for bias return of said means for carriage attachment urging motion of said means for carriage attachment opposite and away from said means for anchoring one end of the longest connecting member with one end of said means for spring return connected to said means for carriage attachment and the other end of said means for spring return connected to said frame;

means for selective excitation of individual solenoid coil assemblies,

wherein said means for bias return tends to urge all of said stop members into abutting relationship and the excitation stroke of each solenoid coil assembly is in a substantially digital relationship with respect to the stroke of the other solenoid coil assemblies so that said means for carriage attachment may be translated to any position corresponding to any combination of the excitation strokes of the individual solenoid coil assemblies.

4,352,049

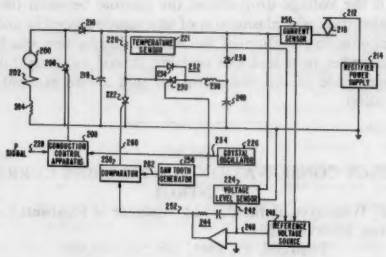
BRAKE CONTROL APPARATUS AND METHOD

James H. Franz, Jr., Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1979, Ser. No. 97,275

Int. Cl.[3] H02P *3/14*

U.S. Cl. 318—370 **6 Claims**



1. In control apparatus for a motor coupled with a vehicle and including a chopper apparatus in the brake mode to supply current to a power supply line, with a filter capacitor connected across said chopper apparatus, the combination of:

means for producing a voltage signal in accordance with the voltage across said filter capacitor,

brake control means connected across said filter capacitor,

means responsive to the current flow in relation to the power line for providing a desired reference voltage for said filter capacitor and having a value determined by said current flow,

means responsive to said voltage signal for providing an error signal in relation to said desired reference voltage value for said filter capacitor voltage,

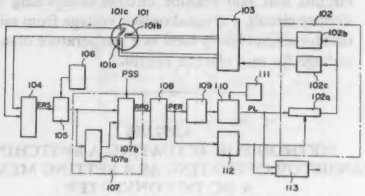
means connected with said chopper apparatus for providing a control signal having a known frequency for determining the operation of said chopper apparatus in accordance with said known frequency, and

signal means responsive to each of the error signal and the control signal and connected with said brake control means for determining the operation of the brake control means in accordance with said known frequency and for a time period proportional to the magnitude of said error signal.

4,352,050
METHOD AND APPARATUS FOR ERROR CORRECTION IN POSITION SENSING CIRCUIT

Tetsurou Sakano, Mitaka, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jul. 10, 1981, Ser. No. 282,269
Claims priority, application Japan, Jul. 14, 1980, 55-95976
Int. Cl.³ G05B 1/06
U.S. Cl. 318—661 6 Claims



1. A method of correcting the error in a position sensing circuit equipped with a sensor including:

primary windings comprising a sine excitation coil and a cosine excitation coil so disposed as to be electrically displaced in phase from each other by $\pi/2$, said sine excitation coil and said cosine excitation coil being excited by a sine-wave primary voltage signal and a cosine-wave primary excitation signal, respectively, each having an amplitude proportional to sin α and to cos α, respectively, for generating an AC flux having an electrical angle α and a constant amplitude, and

a secondary winding which is moved rotatively or linearly with respect to the primary windings in accordance with the movement of a movable body driven by a motor, for producing a sinusoidal secondary voltage signal having an amplitude in accordance with the difference between the electrical angle α and a mechanical angle θ corresponding to the amount the movable body is moved;

a smoothing circuit operatively connected to said secondary winding, for smoothing the secondary voltage signal;

a voltage-to-frequency converter operatively connected to said smoothing circuit, for generating a pulse train having a frequency varying in accordance with the output of said smoothing circuit; and

a primary voltage signal generating circuit operatively connected to said voltage-to-frequency converter and to said primary windings, for generating said primary voltage signals, the electrical angle thereof varies in accordance with the number of pulses in the pulse train so as to make the quantity $(\theta-\alpha)$ equal to zero; said method comprising the steps of:

(a) moving the motor to a first position where said secondary winding is electromagnetically coupled mainly with said cosine excitation coil, and to a second position where said secondary winding is electromagnetically coupled mainly with said sine excitation coil;

(b) varying the electrical angle α by a predetermined amount at said first position and at said second position;

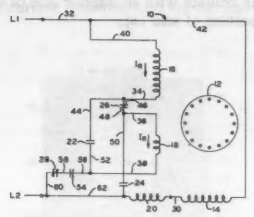
(c) obtaining, at said first position and at said second position, the amount of change in at least one of the following when said electrical angle α has been varied by said predetermined amount: the output voltage of said secondary winding, the number of pulses in said pulse train, and the frequency of said pulse train; and

(d) regulating the excitation voltage of the primary winding constituting and sine excitation coil or said cosine excitation coil in such a manner that the amount of change at said first position and the amount of change at said second position will be equal.

4,352,051
SINGLE PHASE MOTOR WITH REVERSIBLE AUXILIARY WINDINGS

John H. Johnson, Tipp City, Ohio, assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 152,754, May 23, 1980. This application Jul. 16, 1981, Ser. No. 283,870
Int. Cl.³ H02P 1/44
U.S. Cl. 318—790 22 Claims



1. A single phase induction motor comprising: a magnetic core, a main winding disposed on the magnetic core and being adapted for connection to a single phase power source, a start winding disposed on the magnetic core and being adapted for connection to the single phase power source, an auxiliary winding disposed on the magnetic core and adapted for connection to the single phase power source, capacitive means and switching means for establishing a first series connection between the start winding and the auxiliary winding during a start mode of the motor so that current flow through the auxiliary winding establishes a magnetic field which opposes a magnetic field substantially simultaneously established by current flow through the start winding and for establishing a second series connection between the start winding and the auxiliary winding during a run mode of the motor with the second series connection including said capacitive means electrically connected in series with both the auxiliary and start windings, and wherein the second series connection is such that current flow through the auxiliary winding during the run mode of the motor is in a direction opposite to the direction of current flow during the start mode so as to cause the auxiliary winding to establish a magnetic field which is additive to the magnetic field established by the start winding during the run mode, said first and second series connections of said start and auxiliary windings being in parallel with said main winding.

4,352,052
ADAPTOR FOR CHARGING SMALL CELLS IN LARGE-CELL CHARGER

Ray C. Opper, 3263 Vineyard Ave., Sp. 69, Pleasanton, Calif. 94566

Filed Nov. 3, 1980, Ser. No. 203,421
Int. Cl.³ H02J 7/00; H01M 10/46
U.S. Cl. 320—2 11 Claims

1. For use with a charger having a pair of relatively widely-spaced terminals for mating with and charging an energy storage cell having a pair of correspondingly widely-spaced contacts, an adaptor for enabling an energy storage cell having a pair of relatively closely-spaced contacts to be charged in said charger, said adaptor comprising:

means for (a) holding said energy storage cell having said closely-spaced contacts, (b) causing said relatively-closely spaced contacts of said cell, when said cell is held in said adaptor, to be connected electrically with said respective pair of terminals of said charger, and (c) enabling said adaptor to mate physically with said pair of terminals of said charger,

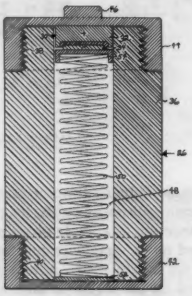
said adaptor having a substantially cylindrical shape,

said adaptor comprising a body portion and removable mating top and bottom portions,

said body portion having an axial through hole extending through said body portion from the top to the bottom thereof,

a spring positioned in said axial through hole and, when relaxed, occupying substantially the entire length of said through hole in said body portion,

said removable top and body portions each comprising a cap which covers a respective end of said through hole so as to captivate said spring, said caps each providing an electrically conductive path from said spring, when said spring is in contact with an interior side of said cap, to an exterior portion of said cap,



each cap mating with said body portion in telescoping relationship and being partially extensible from said body portion in an axial direction without freeing said spring,

whereby energy storage cells of a wide range of lengths, and hence contact spacings, can be held in said adaptor, and a cell of very short length easily can be positioned in the top of said through hole of said adaptor by partially withdrawing the bottom cap from said adaptor to allow said spring to drop down to provide a recess at the top of said through hole, placing said short cell in said recess, fully assembling said top cap to said adaptor, and then fully assembling said bottom cap onto said adaptor to compress said spring.

4,352,053

TEMPERATURE COMPENSATING VOLTAGE GENERATOR CIRCUIT

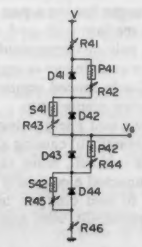
Takuro Oguchi, Kawasaki; Zenichi Ohsawa, Yokohama, both of Japan, and Shinichi Murai, Santa Clara, Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 27, 1981, Ser. No. 257,551

Claims priority, application Japan, Apr. 28, 1980, 55-56546; Apr. 28, 1980, 55-56547; Apr. 28, 1980, 55-56548; Apr. 28, 1980, 55-56549

Int. Cl.³ G05F *1/60*

U.S. Cl. 323—220 **25 Claims**



1. A temperature compensating voltage generator circuit for compensating temperature characteristics of an electric circuit whose electrical characteristic can be controlled by a control voltage, comprising:

a plurality of temperature sensitive circuits each of which comprises a parallel connection of a diode circuit and a temperature sensitive resistor circuit, said temperature sensitive circuits being connected in series; and

one or more resistor circuits which are operatively connected in series with said plurality of temperature sensitive circuits, the series connection of said temperature sensitive circuits and said resistor circuits comprising a voltage divider circuit, a divided output voltage from said voltage divider circuit being used as a temperature compensating voltage for said electric circuit.

4,352,054

METHOD FOR ACTUATING A SWITCHING TRANSISTOR OPERATING AS A SETTING MEMBER IN A DC/DC CONVERTER

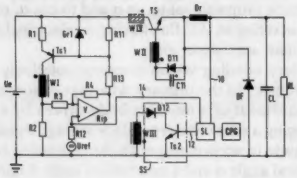
Eckhardt Grünsch, Allmersbach, and Günter Wochele, Oppenweiler, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,545

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008716

Int. Cl.³ G05F *1/56;* H02M *3/335*

U.S. Cl. 323—224 **4 Claims**



1. The method of controlling a dc/dc converter including a first switching transistor having an emitter-collector circuit connected to a load, and a base circuit; a transformer having first, second and third electromagnetically coupled windings, the first winding of said transformer being coupled via a second switching transistor to an input voltage source and being selectively energized from said input voltage source, the second winding of said transformer being connected in the base-emitter circuit of said switching transistor, and the third winding of said transformer being coupled by a control stage to a control switching logic circuit controlled by the voltage across said load, the first, second and third windings of said transformer having polarities such that the first winding of said transformer is energized during the off time of said first switching transistor and said control switching logic circuit selectively energizes said first winding and short-circuits said third winding thereby determining the beginning and end of the conducting period of said first switching transistor, said method comprising the steps of:

(a) short-circuiting said third winding thereby causing the voltage across said second winding to decrease and switch said first switching transistor into its non-conducting state;

(b) energizing said first winding from said input voltage source during the off time of said first switching transistor;

(c) deenergizing said first winding after sufficient energy has been stored in the core of said transformer to actuate said first switching transistor; and

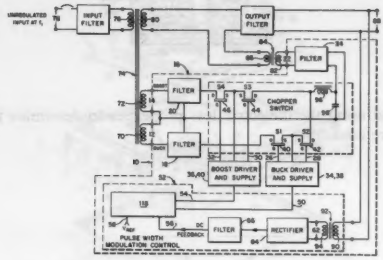
(d) removing the short circuit from said third winding thereby causing the energy stored in said core to be transferred to said second winding and drive said switching transistor into its conducting state.

4,352,055

AC VARIABLE VOLTAGE SOURCE UTILIZING PULSE WIDTH MODULATION

Thomas McCartney, Deerfield, Ill., assignor to ONEAC Corporation, Bannockburn, Ill.

Filed Oct. 24, 1980, Ser. No. 200,433
Int. Cl.[3] G05F *1/30*
U.S. Cl. 323—263 21 Claims



1. An AC variable voltage source comprising:

means responsive to an AC input source for providing a controlled output of variable amplitude and of the same waveform characteristics as said input source, said output providing means comprising electronic switch means responsive to switch control signals for selectively switching in phase and out of phase waveforms of said input source at a switching frequency at least several orders of magnitude higher than the frequency of said input source, and output filter means responsive to said electronic switch means for filtering out the high frequency switching components of said switching frequency; and

switch control means for generating said switch control signals in response to a control input, said switch control signals being effective to control the duty cycle of said switch means at said switching frequency, the magnitude of said control input determining the duty cycle of said switch means and the amplitude of said controlled output,

said variable output providing means further comprising two AC phase inputs, said AC input source providing an AC input to each of said two AC phase inputs, each of said AC inputs being of predetermined amplitude, said two AC inputs being of opposite relative phase, said electronic switch means including first and second phase switch stages, each of said first and second phase switch stages being responsive to a respective one of said two AC phase inputs, each of said phase switch stages including two power MOSFETS each having a drain, a source and a gate control connection, each of said source connections of said MOSFETS in each phase switch stage being connected to each other, each of said gate control connections being connected to one of said switch control signals, each of said phase switch stages being connected between a respective one of said AC phase inputs and said output filter means.

4,352,056

SOLID-STATE VOLTAGE REFERENCE PROVIDING A REGULATED VOLTAGE HAVING A HIGH MAGNITUDE

David L. Cave, Tempe; Steven L. Harris, Mesa, and Don W. Zobel, Tempe, all of Ariz., assignors to Motorola, Inc., Del.

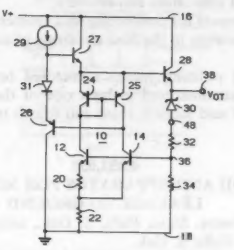
Filed Dec. 24, 1980, Ser. No. 220,207
Int. Cl.[3] G05F *3/18*
U.S. Cl. 323—314 12 Claims

1. A voltage reference for providing an output voltage at an output terminal thereof having independently adjustable temperature coefficient and magnitude, wherein the magnitude of the output voltage is of a relatively high level, including in combination:

first and second transistors, each having emitter, base, and collector electrodes;

a negative feedback loop interconnecting said first and second transistors and the output terminal of the voltage reference, said feedback loop enabling the currents through said first and second transistors to have a predetermined non-unity ratio of current densities;

means connected to said emitter electrodes of said first and second transistors for developing a voltage having a positive temperature coefficient in response to said non-unity ratio of current densities; said voltage having said positive



temperature coefficient combining with the emitter-to-base voltage of one of said first and second transistors to produce a combined voltage in said negative feedback loop having a predetermined variation with temperature; and

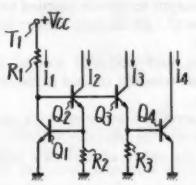
further means coupled in said negative feedback loop providing a voltage having a predetermined variation with temperature which cooperates with said combined voltage to provide a reference voltage having a predetermined temperature coefficient at the output terminal of the voltage reference.

4,352,057

CONSTANT CURRENT SOURCE

Takashi Okada; Hiroshi Sahara, both of Yokohama, and Fumikazu Otsuka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,943
Claims priority, application Japan, Jul. 2, 1980, 55/90185
Int. Cl.[3] G05F *3/16*
U.S. Cl. 323—315 1 Claim



1. A constant current generating circuit comprising:

(A) first, second, third and fourth transistors of one conductivity type each having base, emitter and collector electrodes;

(B) a voltage supply source having first and second voltage terminals;

(C) circuit means for connecting the collector and emitter electrodes of said first transistor to said first and second voltage terminals respectively with a first impedance means between the collector electrode and said first voltage terminal;

(D) circuit means for connecting the emitter electrode of

said second transistor to said second voltage terminal through a second impedance;

(E) circuit means for connecting the emitter electrode of said third transistor to said second voltage terminal through a third impedance;

(F) circuit means for connecting the emitter electrode of said fourth transistor to said second voltage terminal;

(G) circuit means for connecting the base electrode of said first transistor to said emitter electrode of said second transistor;

(H) circuit means for connecting said collector electrode of said first transistor to the base electrodes of said second and third transistors respectively;

(I) circuit means for connecting said emitter electrode of said third transistor to the base electrode of said fourth transistor; and

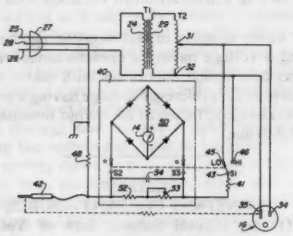
(J) current utilizing means connected between said first voltage terminal and at least one of the collector electrodes of said second, third and fourth transistors.

4,352,058

METHOD AND APPARATUS FOR MEASURING LEAKAGE TO GROUND

Marlin D. Westra, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Feb. 1, 1980, Ser. No. 117,611
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **5 Claims**



1. An instrument for use in measuring leakage currents from a piece of equipment under test to ground, said equipment having first and second electric power input terminals, comprising

an isolation transformer having an input winding adapted to be connected across a source of electric power,

first and second output terminals adapted to be connected to respective ones of said electric power input terminals of said equipment,

means connecting said first and second output terminals across an output winding of said isolation transformer,

an electric probe,

an AC ammeter serially connected with said probe, and

selector switch means for selectively connecting said ammeter to one or the other of said first and second output terminals.

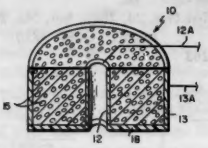
4,352,059

DETERMINATION OF MOISTURE LEVEL IN MATERIALS

Nam P. Suh, Sudbury; Stephen D. Senturia, Boston, both of Mass., and Byung H. Kim, South San Francisco, Calif., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 13, 1980, Ser. No. 159,221
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **19 Claims**

1. A method for determining the moisture content of solid dielectric materials comprises placing a sample of said material between two electrodes, applying an alternating electric field having a frequency in the range of radio waves to said electrodes, determining the dielectric loss properties of said material, and using the dielectric loss properties to determine the moisture content.

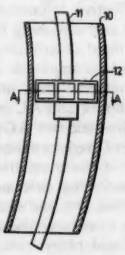


4,352,060

APPARATUS FOR MEASURING THE INTERIOR DIMENSIONS OF A CAST IRON MOLD

Gunnar Garpendahl, Akersberga; Ingrid Bruce, Stockholm, and Ebbe Lundmark, Boden, all of Sweden, assignors to Viak AB, Boden, Sweden

Filed Jul. 1, 1980, Ser. No. 164,900
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **3 Claims**



1. Apparatus for measuring the interior dimensions of a metallic mold having a rectangular cross-section, comprising:

a guide rail adapted to be disposed within a mold, said guide rail having approximately the same curvature as a mold to be measured and being adapted to be secured at along the center line of the mold to be measured; and

a measuring means mounted for movement along said rail, said measuring means including:

a multiplicity of plates mounted on a rim with a plurality of said plates being disposed adjacent the interior of each mold wall such that each plate forms a capacitor together with the adjacent portion of said mold wall, the plates of each wall being arranged adjacent each other parallel to the wall, and each pair of opposed plates on the rim being connected in an oscillating circuit; and

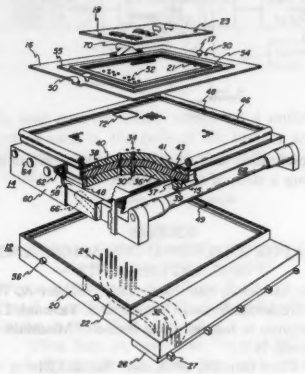
signal processing means for generating and processing signals from said oscillating circuits relating to the capacitances of said capacitors, said signals being indicative of the reasonance frequencies of said oscillating circuits.

4,352,061

UNIVERSAL TEST FIXTURE EMPLOYING INTERCHANGEABLE WIRED PERSONALIZERS

John L. Matrone, Guilderland, N.Y., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 24, 1979, Ser. No. 42,116
Int. Cl.³ G01R *31/02;* H01R *4/64*
U.S. Cl. 324—158 F **16 Claims**



1. A printed circuit board test fixture comprising:

a universal matrix device which includes a plurality of electrical spring loaded test probe assemblies, each probe assembly having a longitudinal axis with a tip at one end and a contact surface at the other end, and a means for holding the probe assemblies spaced apart from one another with the axes substantially parallel to one another and with the tips pointing substantially in the same direction wherein the means for holding include a test probe assembly at every point where a test point is desired for a family of various types of different printed circuit boards to be tested;

a support having rigid posts mounted through it equal in number and corresponding in locations on a one-to-one basis both to test points of the particular circuit board under test and to selected probe assemblies of the plurality of probe assemblies of the universal matrix device;

means for positioning the universal matrix relative to the support so that one end of each post makes contact with a contact surface of the corresponding selected assembly, thereby selecting the electrical test probe assemblies required for testing a required number of test points of the particular type of printed circuit board under test; and

means for bringing the tip of each selected assembly and its corresponding test point together to contact each other.

4,352,062

DIGITAL DISPLAY TYPE TACHOMETER FOR AN AUTOMOBILE

Hiroyuki Nomura, Fujisawa; Teruo Kawasaki, and Mikio Takeuchi, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

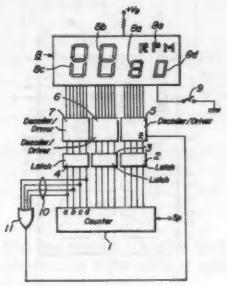
Filed Aug. 13, 1980, Ser. No. 177,630
Claims priority, application Japan, Aug. 24, 1979, 54/107183
Int. Cl.³ G01P *3/48, 3/54*
U.S. Cl. 324—169 **6 Claims**

1. A digital display type tachometer for an automobile for numerically displaying a rotation speed of the engine, comprising:

digital display means comprising display sections for 1000's, 100's, 10's and 1's digits, the 1's digit display section being constructed to display always "zero";

means for counting pulses generated in synchronism with the rotation of the engine to provide a digital signal depending on the rotation speed of the engine;

means for converting the digital signal from said counting means into decimal character signals of 1000's, 100's and 10's digits of the rotation speed and supplying these character signals to said 1000's, 100's and 10's digit display sections;



means for detecting whether the rotation speed of the engine is higher or lower than 1000 rpm and producing a detection signal when the rotation speed of the engine is higher than 1000 rpm; and

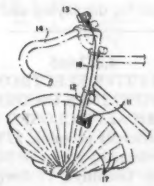
means for controlling in response to said detection signal the 10's digit display section to display "zero".

4,352,063

SELF-CALIBRATING SPEEDOMETER/ODOMETER

Peter W. J. Jones, 70 Oakley Rd., Belmont, Mass. 02178, and Dennis W. Purcell, 121 Allston St., Medford, Mass. 02155

Filed May 8, 1981, Ser. No. 261,759
Int. Cl.³ G01P *3/48, 3/54*
U.S. Cl. 324—171 **12 Claims**



1. An odometer/speedometer system for use on a spoke-wheeled vehicle comprising

spoke magnet and coil detection means mounted on said vehicle near the spokes of a selected wheel thereof, the movement of said spokes passing by said detection means producing an output signal from the coil thereof;

signal processing means being mounted on said vehicle and including

means responsive to said coil output signal for producing a plurality of pulses each corresponding to the passage of a spoke by said detection means;

spoke count means responsive to said spoke pulses for counting said pulses to produce a spoke count signal representing said pulse count;

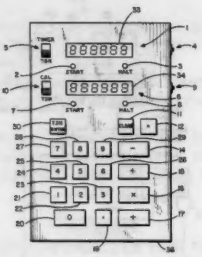
means responsive to said spoke count signal over a selected time period for producing a timed spoke count output signal proportional to the speed of the vehicle.

4,352,064

DEVICE FOR MEASURING THE SPEED OF AN OBJECT TRAVELING BETWEEN TWO FIXED POINTS FROM A STATIONARY OBSERVATION POINT

Ervin T. Dunn, 3003 Overlook Rd., #15, Boise, Id. 83704

Filed Jun. 1, 1979, Ser. No. 44,489
Int. Cl.³ G01P *3/66*; G01B *9/00*
U.S. Cl. 324—178 **9 Claims**



1. Apparatus for measuring the average speed of a vehicle traveling between two line-of-sight reference points from a stationary observation point comprising:

means for entering a set-up speed into said apparatus;

means for utilizing said set-up speed to determine a comparison time-speed unit representing the distance traveled by a set-up vehicle moving between the line-of-sight reference points;

means for storing said comparison time-speed unit;

time pulse generating means;

time counter means for counting said time pulses;

manually operated first-fixed-point switch for initiating the count of said time counter means when the vehicle passes a first reference point;

manually operated second-fixed-point switch for terminating the count of said time counter means when the vehicle passes a second reference point;

divide circuit means for dividing the comparison time-speed unit by the contents of said time counter whereby the resulting quotient is a measure of the vehicle speed; and

speed readout means for displaying said vehicle speed.

4,352,065

NONDESTRUCTIVE ELECTROMAGNETIC INSPECTION OF PIPELINES INCORPORATED IN AN ELECTRICALLY CLOSED LOOP

Viktor I. Rogachev, Jurievsky pereulok, 22 korpus 2, kv. 55; Lev I. Trakhtenberg, Proletarsky prospekt, 54, kv. 39, and Petr N. Shkatov, ulitsa Musy Dzhalilya, 17, korpus 1, kv. 127, all of Moscow, U.S.S.R.

Filed Apr. 19, 1979, Ser. No. 31,484
Claims priority, application U.S.S.R., Apr. 28, 1978, 2604876; Apr. 28, 1978, 2604877
Int. Cl.³ G01N *27/82*; G01R *33/12*
U.S. Cl. 324—238 **30 Claims**

11. A device for nondestructive inspection of a portion of a pipeline incorporated in an electrically closed loop, comprising:

means coupled to said pipeline forming said electrically closed loop;

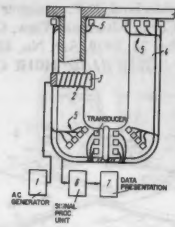
a closed magnetic circuit encircling said pipeline;

an exciting inductance coil connected to said closed magnetic circuit and effective for creating an alternating electromagnetic field in said electrically closed loop;

an a.c. source connected to said exciting inductance;

at least one transducer for measuring a magnetic field at a plurality of points in said electrically closed loop;

a signal processor connected to said at least one transducer and effective to produce an output signal in response to a distribution function of at least one parameter of said magnetic field at said plurality of points; and



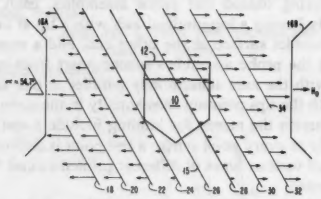
a data presentation unit responsive to said output signal for indicating a state of said pipeline.

4,352,066

METHOD FOR ADJUSTING THE MAGIC ANGLE IN NMR EXPERIMENTS

Raymond D. Kendrick, San Jose, Calif.; Robert A. Wind, Zoetermeer, Netherlands, and Costantino S. Yannoni, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,546
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—321 **5 Claims**



1. A method of orienting the rotation axis of a spinning sample used in a nuclear magnetic resonance (NMR) experiment comprising the steps of:

(a) placing the sample within the r.f. excitation coil and the static external magnetic field of an NMR spectrometer,

(b) superimposing a static magnetic field gradient at an angle of about 54.7° with respect to the direction of the static external magnetic field H_o thereby providing a magnetic field reference axis,

(c) rotating the sample about an axis which makes a second particular angle with respect to the magnetic field reference axis,

(d) observing the width of the NMR resonance lines obtained while rotating the sample, and

(e) changing the second particular angle with respect to the magnetic field reference axis until the width of the NMR resonance lines obtained from rotating the sample is a minimum.

4,352,067

BATTERY ANALYZER

Robert J. Ottone, Newtown, Conn., assignor to DC Electronic Industries, Inc., Wharton, N.J.

Filed Jun. 2, 1980, Ser. No. 155,680
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—434 **14 Claims**

1. Apparatus for testing a battery having a plurality of cells, comprising:

a load bank for interconnection across the battery and for draining current therefrom;

monitor means connected to the battery for measuring the voltage of each of the plurality of cells of the battery and for measuring said current drained by said load bank;

control means interconnected between said load bank and monitor means for regulating said load bank; and

wherein said monitor means comprises a multiplexer connected to each of the cells of the battery and mutually exclusively accessing each of such cells for receiving a cell voltage therefrom.

4,352,068
METHOD OF MEASURING ACTIVITIES BY MEANS OF SOLID ION CONDUCTORS

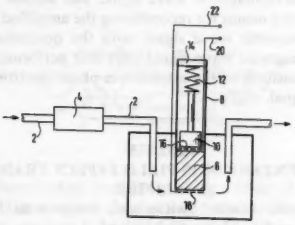
Werner Weppner, Stuttgart, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,597

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926172

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—452 **7 Claims**



1. A method of measuring the activity of a component of a sample medium by means of a solid ion conductor composed of a phase system having N components, wherein N is ≦3, wherein one component corresponds to the component to be measured, comprising equilibrating the solid ion conductor first with the medium, then with the N−2 adjacent phases of the phase system of the N components of the solid ion conductor, and finally with a reference electrode and measuring the voltage between the reference electrode and the medium.

4,352,069
SWITCHED CAPACITANCE SIGNAL PROCESSOR

Roger Dessoulavy, Lausanne, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Dec. 17, 1979, Ser. No. 103,996

Claims priority, application Switzerland, Dec. 18, 1978, 12855/78

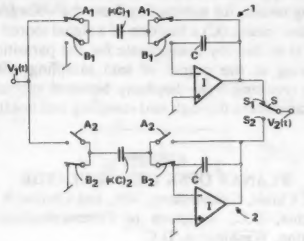
Int. Cl.³ G06G *7/12, 7/18*

U.S. Cl. 328—127 **6 Claims**

1. An electronic circuit comprising:

first and second selective means, each of said selective means being commonly connected to a first input terminal for receiving an applied input voltage, each said selective means comprising: a first capacitor, an integrator means having a second input terminal, a common terminal, and an output terminal providing an output signal, and switching means for connecting said capacitor alternatively between said first input terminal and said integrator means output terminal, and between said common terminal and said integrator means input terminal, in response to a switching signal;

means for providing first and second switching signals to said first and second selective circuits, said switching signals having the same frequency but differing in phase whereby



each of said first and second selective circuits provides for alternate sampling of an input voltage applied to said first input terminal; and

means for combining the output signals at the output terminals of the respective integrator means provided in said first and second selective means.

4,352,070
SAMPLE-AND-HOLD UNIT

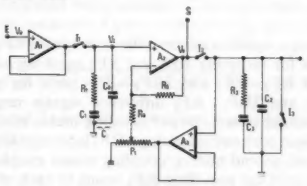
Claude Beauducel, Henouville, and Jacques Cretin, Le Chesnay, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

Filed Apr. 4, 1980, Ser. No. 137,100

Claims priority, application France, Apr. 6, 1979, 79 08801

Int. Cl.³ G11C *27/02*

U.S. Cl. 328—151 **5 Claims**



1. In a sample and hold circuit comprising sampling and holding means for receiving signals and temporarily storing said signals, and subsequently transmitting said stored signals, said sampling and holding means comprising capacitor means (C) for receiving and temporarily storing said signals, input means connectable to the capacitor means (C) for transmitting and charging said capacitor means (C) with said signals, and output means connected to the capacitor means (C) for transmitting the signals stored in the capacitor means (C) for readout, the improvement which comprises:

compensating means for compensating for parasitic voltages delivered by said sampling and holding means resulting from diaphony between successive samples having different amplitudes, said compensating means comprising;

(a) a passive compensation circuit including a capacitor (C_2), intermittently connected to the output of said sampling and holding means, and connected to ground, and said passive compensation circuit adapted to reproduce the operational characteristics of said capacitor means (C),

(b) first breaker means (I_2) connected between the output of said sampling and holding means and said passive compensation circuit for intermittently connecting said passive compensation circuit to the output of said sampling and

holding means, and second breaker means (I_3) operatively associated with said passive compensation circuit for intermittently short-circuiting said passive compensation circuit, and said first and second breaker means adapted for being sequentially actuated, and

(c) subtracting means operatively associated with said passive compensation circuit, and with said sampling and holding means, for subtracting from the voltages stored in capacitor means (C) a fraction of a signal stored in capacitor (C_2) to thereby compensate for the parasitic voltages appearing at the output of said sampling and holding means resulting from diaphony between successive samples transmitted through said sampling and holding means.

4,352,071

PLANAR QPSK DEMODULATOR

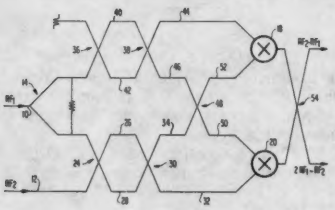
William H. Childs, Gaithersburg, Md., and Christoph E. Mahle, Washington, D.C., assignors to Communications Satellite Corporation, Washington, D.C.

Division of Ser. No. 51,297, Jun. 22, 1979, Pat. No. 4,281,293. This application May 11, 1981, Ser. No. 262,662

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ H04L *27/22*

U.S. Cl. 329—105 **7 Claims**



1. An image rejection mixer of the type having RF_1 and RF_2 input ports for receiving RF_1 and RF_2 input signals respectively, and RF_2-RF_1 and $2RF_1-RF_2$ ports for providing RF_2-RF_1 and $2RF_1-RF_2$ difference signals respectively, first and second mixers, power dividing means connected to said RF_1 input port and supplying a RF_1 input signal to each of said first and second mixers, coupling means coupled to said RF_2 input port for providing RF_2 inputs to each of said first and second mixers, said RF_2 inputs to said first and second mixers being 90° out-of-phase with respect to one another, and output coupling means receiving the outputs of said first and second mixers for providing said RF_2-RF_1 and $2RF_1-RF_2$ signals, said RF_1 and RF_2 input ports adjacent one another and said RF_2-RF_1 and $2RF_1-RF_2$ ports being adjacent one another without the necessity of any signal path crossovers in said image rejection mixer between one of said RF signals and one of said difference signals.

4,352,072

FEEDFORWARD AMPLIFIER WITH ENHANCED STABILITY INTO LOADS WITH HIGH VSWR

Timothy A. Harrington, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 29, 1980, Ser. No. 182,534

Int. Cl.³ H03F *1/26*

U.S. Cl. 330—149 **2 Claims**

1. A feedforward amplifier for amplifying an electromagnetic wave signal for driving an output load impedance, comprising:

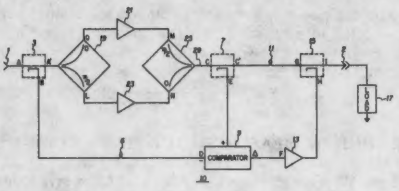
first signal path including, in cascade arrangement, signal amplifier means for amplifying the electromagnetic wave signal, and a first delay network;

second signal path, including in cascade arrangement, a second delay network, summing means, and an error amplifier means;

coupler means for dividing the signal into a first signal component and a second signal component and for coupling the first signal component to the first signal path and the second signal component to the second signal path;

second coupler means for sampling the output of the signal amplifier and coupling the sampled signal to the input of the summing means;

recombiner means for recombining the signal from the first signal path with the signal from the second signal path to obtain an amplified electromagnetic wave signal and



the signal amplifier means includes;

a first Hilbert's transformer means for obtaining a quadrature-phase electromagnetic wave signal and an in-phase electromagnetic wave signal, first amplifier means for amplifying the in-phase electromagnetic wave signal, second amplifier means for amplifying the quadrature-phase electromagnetic wave signal, and second Hilbert's transformer means for recombining the amplified in-phase electromagnetic wave signal with the quadrature-phase electromagnetic wave signal after first performing a Hilbert's transform on the amplified in-phase electromagnetic wave signal.

4,352,073

COMPLEMENTARY MOS FIELD EFFECT TRANSISTOR AMPLIFIER

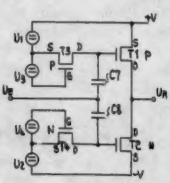
Oskar Leuthold, Marin, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Jun. 13, 1980, Ser. No. 159,073

Claims priority, application Switzerland, Jul. 13, 1979, 6544/79

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—264 **6 Claims**



1. A complementary MOS field effect transistor amplifier for alternating signals, comprising:

an inverter including a first field effect transistor having a first predetermined voltage threshold and a second field effect transistor having a second predetermined voltage threshold, said transistors having insulated gates and being of complementary conductivity;

a first coupling capacitor connected at one end to said gate of said first transistor and a second coupling capacitor connected at one end to said gate of said second transistor, the alternating signals being applied to the other ends of said capacitors;

a third transistor coupled for biasing said first transistor substantially to said first threshold voltage; and

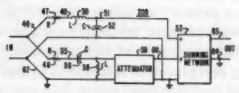
a fourth transistor coupled for biasing said second transistor substantially to said second threshold voltage, said third and fourth transistors being biased to have a high equivalent resistance.

4,352,074

PHASE-LOCKED LOOP FILTER

Herman J. Blinchikoff, Baltimore, and George R. Vaughan, Linthicum Heights, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 1, 1980, Ser. No. 117,704
Int. Cl.[3] H03L 7/08
U.S. Cl. 331—17 10 Claims



1. A phase-locked loop for tracking a selected frequency in an input signal and for providing peak attenuation at fixed frequency spacings from said selected frequency comprising,

a linear phase detector having a first and second input and an output,

an amplifier,

a loop filter,

a voltage-controlled oscillator,

said output of said linear phase detector coupled through said amplifier, loop filter and voltage-controlled oscillator to said first input of said linear phase detector to form a signal loop having an open loop gain K,

means for coupling an input signal to said second input of said phase detector,

means for coupling an output signal from said voltage-controlled oscillator,

said loop filter having a predetermined transfer function $H_L(s)$,

said loop filter including

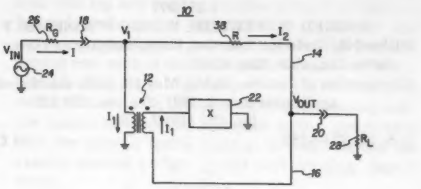
an input terminal coupled to one side of a first and second resistor, the other side of said first resistor coupled through a first inductor to one side of a first capacitor and to a first input of a summing network, the other side of said second resistor coupled through a second capacitor to one side of a second inductor and to a first input of an attenuator network, the output of said attenuator network coupled to a second input of said summing network, the output of said summing network coupled to an output terminal of said loop filter, the other side of said first capacitor, the other side of said second inductor, a terminal of said attenuator and a terminal of said summing network all coupled to a first potential.

4,352,075

SPLIT PHASE DELAY EQUALIZER WITH SINGLE TRANSFORMER AND ADJUSTMENT FOR Q LOSS

Vernon R. Cunningham, Melissa, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 8, 1980, Ser. No. 214,300
Int. Cl.[3] H03H 7/01
U.S. Cl. 333—28 R 3 Claims



1. A split phase delay equalizer using a single transformer, comprising:

a pair of circuit branches connected in parallel between an input and an output;

first resistance means R_g forming an input impedance to said circuit branches and connected to the input of same;

second resistance means R_L forming an output impedance of said circuit branches and connected to the output of same;

a transformer in one of said circuit branches for providing a 180 degree phase inversion of the signal in that branch;

reactance means in a first one of said pair of circuit branches for providing a phase shift of the signal in that branch; and

resistance means only, in the other one of said pair of circuit branches, having a resistance value selected to provide an adjustment shift for Q loss by providing a flat loss shift in amplitude response to eliminate Q loss dip in the latter around the resonant frequency of said reactance means, said reactance means being a series LC network with an equivalent series resistance R_Q due to inductor Q, and wherein said resistance means has a resistance value R,

$$R=R_Q+\sqrt{R_Q^2+4R_GR_L+2R_Q(R_G+R_L)}$$

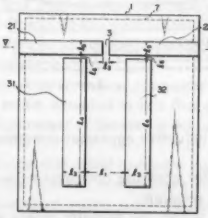
where R_G and R_L are resistance values in said input and output, respectively.

4,352,076

BAND PASS FILTERS

Takeshi Saitoh, Yokohama; Hiroshi Hatashita, Tokyo; Toshio Nagashima, and Susumu Yamamoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,738
Claims priority, application Japan, Sep. 19, 1979, 54-119404
Int. Cl.[3] H01P 1/203, 1/212
U.S. Cl. 333—204 5 Claims



1. A band pass filter consisting of a micro strip line structure, characterized in that a first open end conductor and a second open end conductor are arranged in parallel, the length of each

of said first and second open end conductors being approximately equal to one half of the wave length of the band pass frequency, and an input conductor and an output conductor are arranged opposite to the same side ends of said first and second open end conductors, respectively, forming narrow gaps between said first and second open end conductors, and said input and output conductors, respectively.

4,352,077

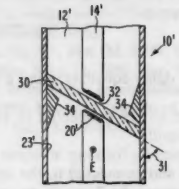
RIDGED WAVEGUIDE WINDOW ASSEMBLY

Richard Z. Gerlack, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 40,360, May 18, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,328

Int. Cl.³ H01P *1/08*

U.S. Cl. 333—252 **13 Claims**



1. A dielectric window assembly for hollow metallic ridged waveguide having an axially elongated ridge defined within an interior wall thereof, comprising:

a notch defined in said ridge axially transversely;

a slab of dielectric sealed across and within a hollow cross-section of said ridged waveguide, said slab having an area at least that of said hollow cross-section of said ridged waveguide, said slab being parallel to the electric field at the center of said waveguide, said slab extending through said notch.

4,352,078

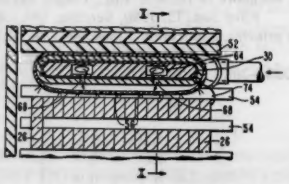
COMBINATION STATIC PLATE AND LIQUID DISTRIBUTION MANIFOLD FOR ELECTRICAL INDUCTIVE APPARATUS

Curtis L. Moore, Hermitage, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 6, 1981, Ser. No. 232,328

Int. Cl.³ H01F *27/08*

U.S. Cl. 336—60 **10 Claims**



1. An electrical inductive apparatus comprising:

a winding;

pressure means for applying compressive stress on the top surface of the winding;

manifold means within the pressure means and adjacent to the top surface for distributing a dielectric fluid coolant by gravity flow over the winding;

the manifold means comprising an inner rigid core of dielectric material, a coating of metal foil on the core, and an outer member surrounding the foil-coated core and providing fluid-conducting passage means with the core and the coating;

inlet means for introducing the dielectric fluid coolant into the fluid-conducting passage means and including outlet means for draining the coolant from the passage means and onto the winding; and

the metal foil serving as an electrostatic shield for and electrically connected to the winding.

4,352,079

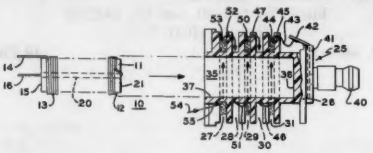
HIGH VOLTAGE IGNITION TRANSFORMER

Dale A. Mueller, St. Paul, and Timothy P. Sperry, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 24, 1981, Ser. No. 286,407

Int. Cl.³ H01F *15/02, 15/10, 27/30*

U.S. Cl. 336—65 **10 Claims**



1. A high voltage ignition transformer which is adapted to be mounted upon an insulating surface, including: a core formed of a magnetic material having a coil winding surface, a mounting end, a confined end, and a recess with said recess formed generally coaxial with said coil winding surface between said ends; a primary winding provided upon said winding surface with said primary winding have two winding ends; a first winding end projecting at said core mounting end, and a second winding end placed in said recess to lead said primary winding from said core confined end to said core mounting end to allow connection to both ends of said primary winding at said core mounting end while causing said second winding end to be spaced from said primary winding; a bobbin formed of an insulating material having a plurality of bays in spaced relationship to one another; said bobbin including a cavity within said bobbin with said bobbin cavity having an open end and a closed end; said cavity receiving and enclosing said core and said primary winding by said core and said primary winding being placed in said cavity through said open end of said bobbin; and a secondary winding for said high voltage transformer being wound on said bobbin with said secondary winding being placed in alternate bays of said bobbin to insulate said alternate bays of said secondary winding from each other.

4,352,080

FERRITE CORE

Tadashi Mitsui, Tokyo; Masaru Wasaki, Ichihara, and Junpei Ohta, Matsudo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,978

Claims priority, application Japan, Sep. 25, 1979, 54-132150[U]

Int. Cl.³ H01F *27/24*

U.S. Cl. 336—83 **2 Claims**

1. A ferrite core half for use in a power supply circuit comprising:

(a) a circular center boss;

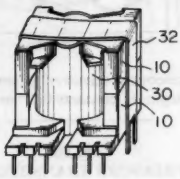
(b) a pair of outer walls positioned at both the sides of said boss for mounting a coil;

(c) a pair of base plates coupling a portion of said boss with said outer walls, said base plates extending from the periphery of said boss to the side surface of said walls wherein said boss, walls and base plates form an E-shaped structure and wherein the end portion of said boss, end

portions of said walls and said base plates are all aligned in a single plane; wherein:

(d) each of the outer walls is substantially rectangular with an external linear wall and an inner wall which is coaxial with said circular boss and the width of said external linear wall is larger than the diameter (d_3) of the circular boss;

(e) each of said base plates is substantially in a sector shape having a pair of tapers which are gradually opened towards the outer walls each taper having two portions at different opening angles, and the portions of said boss which are coupled to said base plates are less than the



whole of the periphery of said boss such that a space is formed between said base plates along the periphery of said boss;

(f) the area (S_3) coupling said base plates with said outer walls is larger than the half of the cross-sectional area ($\frac{1}{4}\pi d_3^2$) of said boss;

(g) the area (S_2) coupling said boss with the base plates is substantially the same as half of the cross-sectional area ($\frac{1}{4}\pi d_3^2$) of said boss; and

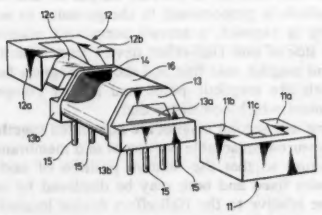
(h) the area (S_1) of the cross-section of each of said outer walls is substantially the same as half of the cross-sectional area ($\frac{1}{4}\pi d_{32}$) of said boss.

4,352,081

COMPACT TRANS CORE

Seiichi Kijima, Tokyo, Japan, assignor to Kijima Musen Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 199,642
Int. Cl.³ H01F *27/24, 27/30*
U.S. Cl. 336—198 **3 Claims**



1. A transformer comprising:

a core including;

a substantially trapezoidal central core leg having a base with opposite edges and first and second planar side members, each said side member intersecting a different one of said edges of said base at an angle less than 90°;

a first core side leg having a first planar surface closely spaced to and in parallel with said first planar side member; and

a second core side leg having a second planar surface closely spaced to and in parallel with said second planar side member; and

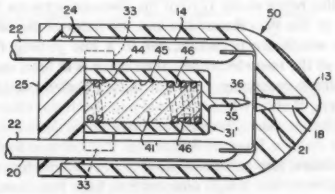
a bobbin member receiving a core winding, said bobbin member having a first end, a second end, and a trapezoidal cross-section and including a trapezoidal central aperture extending through the length of said bobbin member from said first end to said second end, said central trapezoidal aperture receiving said trapezoidal central core leg, said bobbin member separating said first and second planar side members of said central core leg from said first planar surface of said first core side leg and said second planar surface of said second core side leg said bobbin member further including a first enlarged terminal block member at said first end and a second enlarged terminal block member at said second end, each of said enlarged terminal block members receiving a plurality of spaced apart terminal pins interconnected with said core winding and having exterior lateral surfaces and a bottom surface coextensive with the exterior lateral surfaces of said core and the exterior bottom surface of said core winding, respectively.

4,352,082

THERMAL FUSE

Leon G. Barry, and Willis E. Rieman, both of Shelby, N.C., assignors to Fasco Industries, Inc., Boca Raton, Fla.

Filed Feb. 25, 1981, Ser. No. 238,018
Int. Cl.³ H01H *37/76*
U.S. Cl. 337—409 **15 Claims**



1. A thermal fuse, comprising

a housing having therein a sealed chamber, a wire lead extending through said housing and having intermediate its ends a thin, flattened section disposed in said chamber,

means supporting one side of said flattened section of the lead in confronting relation to a recessed die surface formed in one wall of said chamber,

an electrically non-conductive sabot having thereon a sharp cutting edge, and mounted at the opposite side of said flattened section of the lead for movement in said chamber between a first position in which said cutting edge faces said opposite side of flattened section of the lead, and a second position in which said cutting edge is seated in a recess in said die surface,

temperature-responsive means connected to said sabot releasably to retain the sabot in said first position, when the ambient temperature of the fuse is below a predetermined value, and

means for driving said sabot suddenly into its second position, when the ambient temperature of the fuse exceeds said predetermined value, whereby during travel of the sabot from its first to its second position the cutting edge thereon serves completely through said flattened section of said lead,

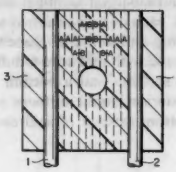
said wire lead, including said flattened section thereof, being of substantially the same cross sectional area throughout its length.

4,352,083

CIRCUIT PROTECTION DEVICES

Lee M. Middleman, Portola Valley; Joseph H. Evans; Arthur E. Blake, both of Palo Alto, and Victor A. Scheff, Berkeley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 21, 1980, Ser. No. 142,053
Int. Cl.³ H01C *7/02, 7/13*
U.S. Cl. 338—23 **32 Claims**



1. A circuit protection device whose largest dimension is less than 12 inches, which has a resistance at 23° C. of less than 100 ohms and which comprises

(1) a conductive polymer element, at least a part of which is a PTC element, and

(2) two electrodes, at least one of which has an electrically active surface of a generally columnar shape, and which can be connected to a source of electrical power and, when so connected, cause current to flow through said PTC element;

said device being such that, if the portion thereof between the electrodes is divided into parallel-faced slices, the thickness of each slice being about 1/10 of the distance between the closest points of the two electrodes and the faces of the slices being planes which are perpendicular to a line joining the closest points of the two electrodes, then there is at least one Type A slice which comprises a part of the PTC element and at least one Type B slice whose thermal and electrical characteristics are such that, when the current through the device is increased rapidly from a level at which the PTC element is in a low temperature, low resistance state to a level which converts the PTC element into a high temperature, high resistance state, the Type B slice increases in temperature at a rate which is greater than the rate at which the PTC element in the Type A slice increases an temperature;

subject to the proviso that neither of the slices adjacent an electrode is a Type B slice which comprises a part of the PTC element in contiguity with the electrode.

4,352,084

VARIABLE RESISTOR DISK ASSEMBLY

William B. Graves, Cerritos, and James F. Walsh, Irvine, both of Calif., assignors to EECO Incorporated, Santa Ana, Calif.

Filed Nov. 13, 1980, Ser. No. 206,593
Int. Cl.³ H01C *10/16*
U.S. Cl. 338—127 **12 Claims**

1. A rotary variable resistor, comprising;

(a) an insulative planar element (1 or 1') having opposed parallel surfaces,

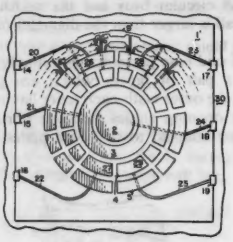
(b) plural circular electrically conductive contacts (2,3) coplanarly upon a said surface,

(c) plural concentric annular conductive rings (4,4',5,5'), having multiple separate contacts surrounding said plural circular contacts coplanarly upon a said surface,

(d) electrically resistive paths (9 or 9') planarly structurally integral with said contacts and rings, upon a said surface,

(e) conductive means (6 or 6'), planarly upon a said surface of said planar element electrically connecting said separate contacts of said annular rings to said resistive paths, and

(f) means for rotatively contacting (35,36,43,44,46,49,47,50) at least one of said circular contacts (2,3),



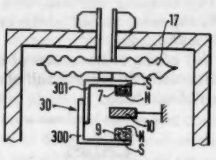
and for simultaneously selectively contacting at least one ring of said separate contacts (4,4' or 5,5').

4,352,085

PRESSURE TRANSDUCER

Werner Herden, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,433
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013857
Int. Cl.³ H01L *10/10, 43/06*
U.S. Cl. 338—42 **6 Claims**



1. A transducer for measuring pressure comprising a membrane mounted so as to be at least in part displaced by pressure to which it is exposed, a Hall-effect device for producing an electrical signal dependent upon the magnetic field in which it is located, a first permanent magnet mounted for producing a magnetic field such as to provide output of said Hall-effect device which is proportional to the pressure to which said membrane is exposed, a second permanent magnet on the opposite side of said Hall-effect device from which said first permanent magnet, said first and second magnets facing each other with like magnetic poles, and further comprising the improvement which consists in that:

said first and second magnet are connected together and to a pressure-displaceable portion of said membrane by rigid structure so that the relative position of said magnets remains fixed and both may be displaced by said membrane relative to the Hall-effect device located between them.

4,352,086

METHOD AND A CIRCUIT ARRANGEMENT FOR MODIFYING CONTROL INFORMATION IN A TRAFFIC SIGNAL SYSTEM, PARTICULARLY A STREET TRAFFIC SIGNAL SYSTEM

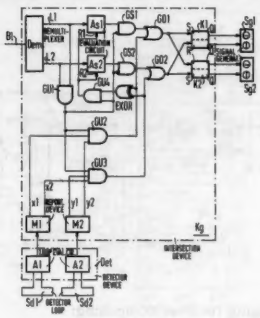
Walter Hunziker, Buehler, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,710
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922927
Int. Cl.³ G08G *1/00, 1/07*
U.S. Cl. 340—35 **9 Claims**

9. In a method of modifying central control information

commands forming signal programs, which includes the steps of transmitting the central control information commands from a central station to an intersection device of a traffic signal system which controls traffic signal generators connected thereto, and by transmitting local control information commands obtained from traffic information from an area whose traffic flow is controlled by the signal generators, the improvement comprising the steps of:

transmitting control information commands from the central



station to the intersection device with periods of overlapping control information commands, said periods defining permission time for controlling said signal generators only by said local control information commands; and

detecting such periods of overlapping control information commands; and

transferring operational control of said traffic signal generators from said control information commands transmitted from said central station to said local control information commands.

4,352,087

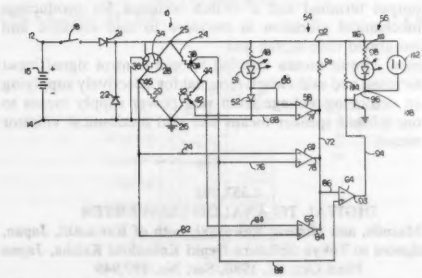
FUME DETECTOR AND ALARM SYSTEM

Edward A. Wittmaier, St. Charles, Mo., assignor to Marie C. Kercheval, St. Charles, Mo.

Filed Apr. 22, 1981, Ser. No. 256,386

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—632 **12 Claims**



1. A fume detector apparatus for monitoring a predetermined atmosphere comprising an electric circuit including a Wheatstone bridge having a pair of input and a pair of output connections, a source of energy and means connecting the energy source across the pair of bridge input connections, said bridge circuit including parallel impedance paths connected across the input connections, one of the parallel paths being formed by a sensor element whose impedance varies with the condition of the atmosphere being monitored in series with another impedance, the other parallel path being formed by series connected impedance devices, an alarm device, and means connected between the Wheatstone bridge and the alarm device including a first circuit operatively connected across the bridge output connections for detecting a first bridge voltage condition, a second circuit operatively connected across a selected portion of the other parallel bridge path for detecting a second bridge voltage condition, a third circuit operatively connected across selected portions of both parallel bridge paths for detecting a third bridge voltage condition thereacross, each of said first, second and third circuits having respective inputs connected to the bridge circuit and output connections, the output connections of said first, second and third circuits being connected together to a common connection, and a fourth circuit having a first input connected to the common output connection and a second input connected to the bridge circuit at a location therein so as to respond to any one of said voltage conditions detected by the first, second and third circuit, said fourth circuit having an output connection operatively connected to the alarm device.

4,352,088

VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

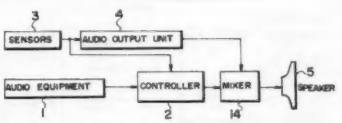
Masakazu Tsunoda, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 15, 1980, Ser. No. 169,034

Claims priority, application Japan, Jul. 16, 1979, 54-90082

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **5 Claims**



1. A voice warning system for an automotive vehicle comprising:

(a) a plurality of sensors for detecting various abnormal conditions in an automotive vehicle,

(b) means for outputting voice warning information in response to said sensors when one of said sensors detects an abnormal condition; and

(c) means for reducing to an audible level lower than an initial audible level an audio signal level sent from other audio equipment provided within the same vehicle so as not to interfere with the voice warning information, said means for reducing the audio signal level being activated by a signal sent from any one of said sensors,

whereby the driver can hear the voice warning information clearly even when the audio equipment is operating.

4,352,089

VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Hiroshi Yano, HigashiYamato, and Masakazu Tsunoda, Fujisawa, both of Japan, assignors to Nissan Motor Company Limited, Kanagawa, Japan

Filed Aug. 28, 1980, Ser. No. 182,240

Claims priority, application Japan, Aug. 31, 1979, 54-119115[U]

Int. Cl.³ H04B *15/00*

U.S. Cl. 340—52 F **9 Claims**

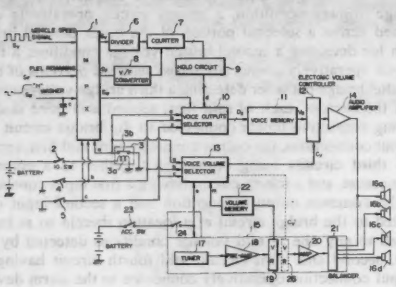
1. A volume control system of a voice warning system for an automotive vehicle, comprising:

(a) a volume setting means for setting a desired volume level of audio equipment provided in the vehicle;

(b) means for holding the volume setting of said audio equipment; and

(c) means for controlling the output volume of the voice warning system according to the sound volume setting of

the audio equipment stored in said holding means so that the output volume level of the voice warning system is higher than that of the audio equipment,



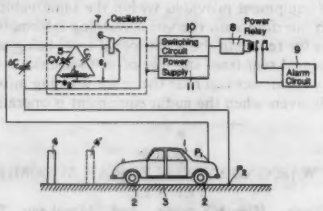
whereby the warning information can always be heard at an appropriate level above the sound volume of the audio equipment.

4,352,090

DETECTION AND ALARM DEVICE FOR USE WITH CAR FOR DETECTING OBSTACLE AND ABNORMAL CONDITIONS OF TIRE

Satoru Ohama, No. 5-59, Tachibanadai 1-chome, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jan. 30, 1981, Ser. No. 230,294
Int. Cl.³ B60C *23/00*; G08B *19/00*
U.S. Cl. 340—52 R **15 Claims**



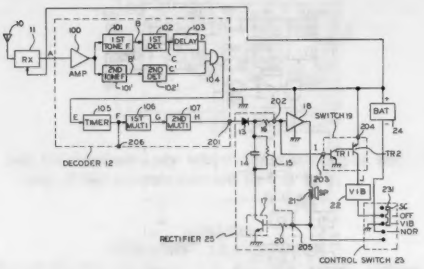
1. A method for detecting the approach of an automobile to obstacles, comprising the steps of: providing an automobile, a capacitance change detection means for detecting a variation of capacitance, an alarm means for activating an alarm when the detecting means detects a given variation of capacitance, first and second electrodes connected to the detecting means for measuring a capacitance between the first and second electrodes, and the first electrode being electrically connected to a metal body of the automobile and the second electrode being electrically coupled to ground; and activating the alarm means based upon a capacitance between ground and the automobile body and thus between the electrodes when the automobile approaches an obstacle.

4,352,091

RADIO PAGER HAVING OPTIONAL ANNUNCIATING MEANS

Koji Yamasaki, Tokyo, Japan, assignor to Nippon Electric Co., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,306
Claims priority, application Japan, Jan. 8, 1979, 54-1026[U]
Int. Cl.³ G08B *7/00*; H04B *5/04*; H04M *11/02*
U.S. Cl. 340—311.1 **5 Claims**



1. A radio paging receiver comprising:
power supply means;
receiver means for receiving and demodulating paging signals to provide a demodulated signal;
decoder means coupled to the output of said receiver means for decoding said demodulated signal to provide a tone signal at a first output terminal;
means including an input terminal for causing a control signal to appear;
rectifier-integrator circuit means coupled to said first output terminal for rectifying said tone signal, for selectively integrating the rectified tone signals in response to said control signal, and for selectively supplying one of said rectified tone signal and the rectified and integrated tone signal to a second output terminal;
speaker means coupled between said second output terminal and said control signal input terminal for generating an audible alert tone in response to said rectified tone signal, and for supplying said rectified and integrated tone signal to said control signal input terminal, as said control signal, without any audible alert tone;
mechanical vibrator means coupled between said second output terminal and a switch terminal for producings mechanical vibration in response to said rectified and integrated tone signal; and
control circuit means coupled to said control signal input terminal and said switch terminal for selectively supplying an activating voltage from said power supply means to one of said speaker means and said mechanical vibrator means.

4,352,092

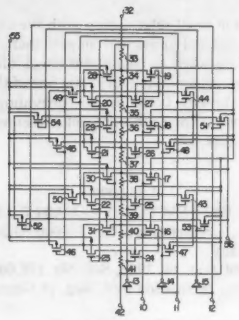
DIGITAL TO ANALOG CONVERTER

Eiji Masuda, and Hiroshi Kawasaki, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 17, 1980, Ser. No. 197,949
Claims priority, application Japan, Oct. 22, 1979, 54-136252
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **10 Claims**

1. A circuit for converting a digital signal having N bits into an analog voltage having 2^N different values, comprising:
N digital input terminals;
an analog output terminal;
a voltage divider having a pair of reference voltage terminals, voltage dividing elements, and 2^N voltage dividing points; and
a switch array comprising N stages of CMOS FET circuits, with each circuit having a first channel MOS FET whose

back gate is connected to a power source terminal and a second channel MOS FET whose back gate is connected to said voltage divider and whose source and drain are connected, respectively, to the source and drain of the first channel MOS FET, each of said CMOS FET circuits having first and second terminals and having current paths interconnecting said first and second terminals, said switch array being adapted to connect one of said voltage dividing points of said voltage divider to said analog output terminal according to the level at said digital input



terminals wherein the first terminals of the CMOS FET circuits of the first stage are connected respectively to the voltage dividing points of said voltage divider, the first terminals of each CMOS FET circuit of the Ith stage (I=2, 3, 4, . . . , N) are connected to respective second terminals of MOS FET circuits of the (I−1)th stage, the second terminals of the CMOS FET circuits of the Nth stage are connected to the analog output terminal, and the control gates of all the CMOS FET circuits of each stage are connected to a corresponding digital input terminal.

4,352,093

HIGH-SPEED DIGITAL/ANALOG CONVERTER

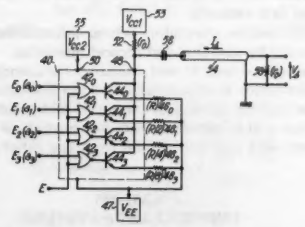
Antoine Laures, 16, rue d'Arcueil, 92120 Montrouge, France

PCT No. PCT/FR80/00059, § 371 Date Dec. 19, 1980, § 102(e) Date Dec. 4, 1980, PCT Pub. No. WO80/02348, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 15, 1980, Ser. No. 220,035

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **3 Claims**



1. A high-speed, digital/analog converter comprising: a logic circuit with coupled emitters comprising a first stage formed by logic gates having a plurality of inputs and one output and a second, current amplification stage formed by the same number of transistors as there are logic gates, each transistor having an emitter, a base and a collector, each base of a transistor of the second stage being connected to the output of a logic gate of the first stage, said logic circuit also having a first supply line and a voltage V_{cc1} and connected to all the collectors of the transistors of the amplification stages, a second supply line at voltage V_{cc2}, which differs from the first and is connected to the logic gates of the first stage, and a third supply line at a voltage V_{EE} and connected to the two stages, and resistors connected to the emitters of the transistors, the resistor connected to the transistor of rank k having the value $R/2^k$, while all the resistors are joined in parallel to the line V_{EE}, a matched load line connected to the first line V_{cc1} via a capacitor, each bit of rank k of the digital signal to be converted being applied to the input of the logic gate connected to the transistor of the same rank k, the analog conversion signal being constituted by the total current I_S flowing in the load line.

4,352,094

DEVICE FOR ACQUIRING AND AVERAGING SAMPLES OF A NOISY PERIODIC SIGNAL

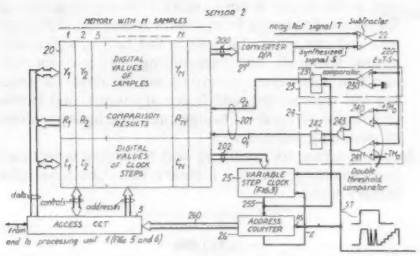
Michel E. Reneric, Paris, France, assignor to Telediffusion de France, Paris, France

Filed Mar. 11, 1981, Ser. No. 242,623

Claims priority, application France, Mar. 17, 1980, 80 05928

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **9 Claims**



1. Device for acquiring and averaging samples of an analog noisy periodic signal whose period is made up of a first portion with a signal and a second portion without, comprising:

means for subtracting said first portion of said noisy signal from analog samples that are precalculated during the preceding second portion of said noisy signal to produce an analog error signal;

means for comparing said error signal with zero, a predetermined voltage threshold and the negative thereof to produce for each sample a first bit representative of the magnitude of the modulus of said error signal in relation to said voltage threshold and a second bit representative of the sign of said error signal;

first means for memorizing at least the precalculated digital values of said samples and said first and second bits;

means for reading and writing in synchronism each sample digital value and the first and second bits resulting from the comparisons at a predetermined recurrent time of said first signal portion;

means for converting said digital values of said samples into said analog samples; and

digital means reading the memorized digital value of each sample and the first and second resulting bits for calculating a new sample digital value which is statistically closer to the corresponding amplitude of said periodic signal and for writing said new sample digital value into said first memorising means during at most said second signal portion.

4,352,095

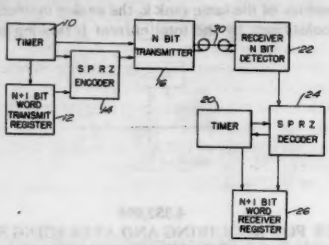
A/D DYNAMIC RANGE ENHANCING TECHNIQUE

Gerald L. Assard, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1981, Ser. No. 277,298

Int. Cl.[3] H03K *13/24*

U.S. Cl. 340—347 DD 2 Claims



1. An analog to digital range enhancer comprising:

encoding means for changing an N+1 binary bit word to an N ternary word without loss of information and for transmitting said N ternary word, said encoding means comprises an N+1 binary bit word transmit register having an N binary bit shift register and a one binary bit source, a sign polar return to zero encoder having separate inputs for receiving signals from said N binary bit shift register and said one binary bit source and having a plurality of output terminals, and transmitting means connected to said sign polar return to zero output terminals for generating and transmitting said N ternary word, said transmitting means comprises a bridge circuit including a plurality of switching devices; and

decoding means for receiving said N ternary word and for reconstructing said N+1 binary bit word from said N ternary word.

4,352,096

DEVICE FOR PROVIDING A MODULO-N CHECK CHARACTER

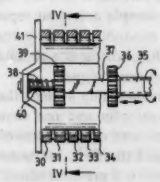
Uwe Unglaube, and Friedrich V. Miehe, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,217

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1978, 2842905

Int. Cl.[3] G08C *9/06*; G08B *5/00*

U.S. Cl. 340—815.06 1 Claim



1. A device for mechanically generating a modulo-n check character, said device comprising:

a group of rotatable data character wheels, each wheel having a plurality of characters on its outer circumference, said character wheels being initially arranged so as to present a given sequence of data characters, one character from each wheel;

a rotatable check character wheel having a plurality of characters on its outer circumference, said check character wheel being initially arranged to provide a modulo-n check character for the initially presented sequence of data characters;

a rotatable shaft adapted to slide in a longitudinal direction relative to said wheels;

a setting wheel mounted on the shaft inside said wheels, operative to engage one of the data wheels and upon rotation of the shaft to rotate the engaged wheel to produce a different data character in the presented sequence; and

a drive wheel in fixed relationship with the check character wheel and slideably mounted on said shaft, adapted upon rotation of the shaft to rotate said check character wheel a predetermined amount every time one of the data wheels is rotated thereby continuously providing a modulo-n check character for each different presented sequence of data characters.

4,352,097

ANTI-THEFT SYSTEM FOR VALUABLE TRANSPORT

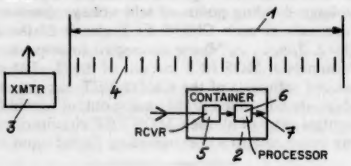
Walter Hamann, Kreillerstrasse 52, D-8000 München 80, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 178,087

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933893

Int. Cl.[3] G08B *13/22*

U.S. Cl. 340—571 17 Claims



1. In an anti-theft system for the transport of a container for valuables along a short path between a safe and a waiting valuables transport vehicle, said system having a transmitting unit, separate from said container, for transmitting signals able to be received by a receiving unit on said container, and having a security apparatus designed to be put into operation when said receiving unit receives no signal, the improvement comprising:

a first memory in said transmitting unit,

a second memory in said receiving unit, for cooperating with said first memory,

an information generator, whose information may be recorded by said first and second memories,

a comparison unit at said container for comparison of said information as sequentially read out from said two memories and for causing operation of said security apparatus when said information from one memory is not in agreement with said information from said other memory.

4,352,098

SURVEILLANCE SYSTEMS

James H. Stephen; John D. McCann, and Michael A. Flemming, all of Abingdon, England, assignors to Parmeko Limited, Leicester, England

Filed May 16, 1980, Ser. No. 150,461

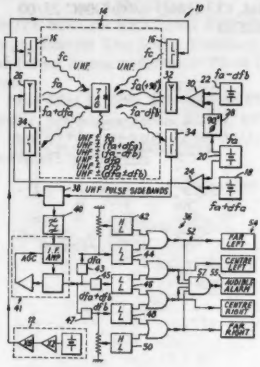
Claims priority, application United Kingdom, May 18, 1979, 7917347

Int. Cl.[3] G08B *13/14, 13/24*

U.S. Cl. 340—572 8 Claims

1. A method of detecting the presence and position in a surveillance zone of an electromagnetic wave passive receptor reradiator with signal mixing capability, comprising the steps of simultaneously radiating first, second and third energy fields

through said zone for causing said receptor reradiator to radiate at least one reply signal which is a function of said energy fields, wherein said first energy field is produced by a microwave signal, said second and third energy fields are produced by low frequency signals relative to said microwave signal, said second energy field is produced by continuously radiating a first pair of closely spaced apart signals and said third energy



field is produced by continuously radiating a second pair of closely spaced apart signals, said second and third energy fields being radiated into said zone at spaced apart locations adjacent the edges of said zone, and said reply signal is the function of the position of said receptor reradiator; detecting in said zone the presence of said reply signal; indicating the position of the receptor reradiator in the zone; and triggering an alarm in response to detection of said reply signal.

4,352,099

GAS SENSING UNIT FOR USE IN ENVIRONMENT COMPRISING EXPLOSIVE GASES

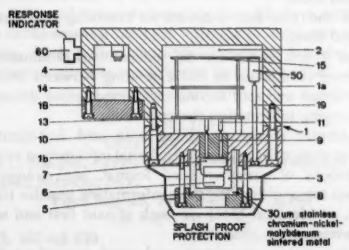
Peter Christen, Männedorf; Hansheinrich Brändli, Uster; Bernhard Durrer, Stäfa, and Arnim Sauerbrey, Adetswil, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Mar. 10, 1980, Ser. No. 128,529

Claims priority, application Switzerland, Mar. 16, 1979, 2482/79

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—633 **12 Claims**



1. In a gas sensing unit for use in environments containing explosive gases and which in connection with a central station forms a gas sensing signaling system and which gas sensing unit contains a gas sensor which, in the presence of reducing gases, alters its electrical resistance, the improvement which comprises:

housing means containing at least two separated chambers defining first and second chambers;

said first chamber comprising a compression-proof chamber;

electronic evaluation circuit means contained in said first compression-proof chamber;

said second chamber comprising an explosion protected chamber;

a cover member for closing said second chamber;

said cover member being formed of a gas pervious sintered metal rendering possible the exchange of gas with the surrounding atmosphere;

a balancing adapter provided for said gas sensor and contained within said second chamber;

said gas sensor and said balancing adapter collectively forming a gas sensor/adapter-unit;

said housing means including a cover for closing said first chamber; and

said gas sensor/adapter-unit being pluggably arranged in said cover of said housing means.

4,352,100

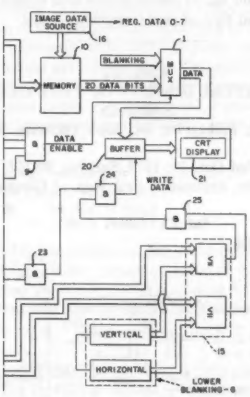
IMAGE FORMATTING APPARATUS FOR VISUAL DISPLAY

Stephen B. O'Connell, Trumansburg, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 24, 1980, Ser. No. 210,085

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—723 **5 Claims**



1. An image formatting apparatus for a visual display comprising:

memory means for storing image data at addressable locations;

display means for displaying image data;

addressing means for generating sequentially and periodically all of the memory addresses of said memory means;

image means for providing memory addresses at which image data is to be read out;

comparing means for comparing the memory address generated by said addressing means with the addresses provided by said image means and for providing address signals to said memory means when a correspondence exists;

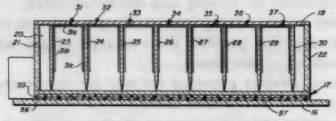
blanking means for providing blanking signals to said display means; and

means interposed between said display means, said blanking means and said memory means for controlling the receipt of blanking signals and image signals by said display means to provide a desired image format.

4,352,101
FLAT PANEL DISPLAY SYSTEM

Michael C. De Jule, Chicago, Ill., assignor to Lucitron, Inc., Northbrook, Ill.

Filed Jun. 20, 1980, Ser. No. 161,504
Int. Cl.[3] G09G 3/28
U.S. Cl. 340—769 20 Claims

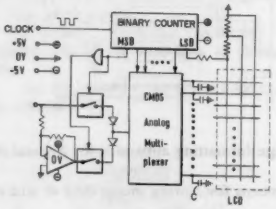


1. In a flat panel display system, a display unit comprising a transparent front wall, a plurality of supporting walls having forward edges in supporting relation to spaced rear surface portions of said front wall, means for developing at least one plasma sac within said unit and behind said front wall in a region aligned with the space between two of said supporting walls, and first and second groups of electrodes for effecting scanning movements of said sac from one point to another within said region, said first group of electrodes extending in parallel relation to each other and in transverse relation to said supporting walls, and said second group of electrodes including electrodes adjacent the forward edges of said two of said supporting walls and operative in response to application of suitable potentials thereto to establish a field adjacent forward edges of said two of said supporting walls such as to allow movement of said sac to points within said region and in close proximity to said two of said supporting walls.

4,352,102
LIQUID CRYSTAL DISPLAY OF TIME DEPENDENT SIGNALS

Günter Kramer, Falkenring 4a, 3303 Vechelde, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 89,105
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849221
Int. Cl.[3] G09G 3/36
U.S. Cl. 340—784 6 Claims



1. An instrument for displaying time-dependent signals in a histogram-like format of signal strength versus time, comprising:

a liquid crystal display having a first system of parallel elongated electrodes and a second system of parallel elongated electrodes, the first and second systems being perpendicular to each other;

a biasing network connected to the electrodes in the second system and applying bias voltages thereto in a manner that bias voltage of each electrode in the second system is greater than bias voltage of each next electrode in the second system;

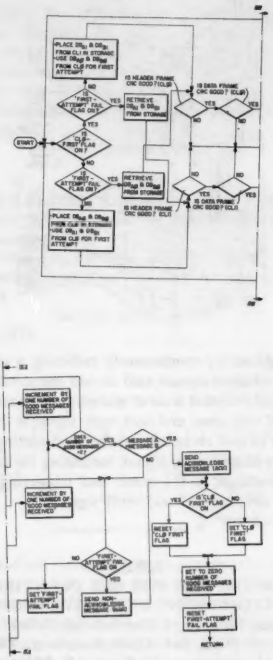
an analog signal input; and

an electronic switch connecting the analog signal input to all of the electrodes in the first system in a sequential fashion of repeated sweeps.

4,352,103
INDUSTRIAL CONTROL SYSTEM

Billy R. Slater, Plano, Tex., assignor to Forney Engineering Company, Carrollton, Tex.

Filed Jan. 24, 1980, Ser. No. 115,160
Int. Cl.[3] H04Q 9/00; G08C 25/00
U.S. Cl. 340—825.01 4 Claims



1. An information transfer system for transmitting digital information between active devices and testing the validity of the transmitted information, said system comprising:

at least one active device for transmitting information in digital form;

at least one other active device for receiving information in digital form;

at least a first and a second independent communication channel connected to and extending between said first-mentioned and said second-mentioned active devices for conveying information therebetween;

a transmitter means associated with said first-mentioned active device for transmitting digital information arranged in blocks of predetermined format, said transmission means transmitting, for each information transfer transaction, an identical block on each of said first and second communication channels;

receiving means associated with said second-mentioned active device for receiving digital information transmitted by said first-mentioned active device and for selecting a one of said first and second communication channels and testing the validity of the received block and, when said received block from said first selected communication channel is found invalid, for selecting the other of said first and second communication channels and testing the valid-

ity of the received block on said other communication channel; and

means associated with said receiver means for first-selecting the first of said communication channels on alternate information transfer transactions and for first-selecting the second of said communication channels on the remaining information transfer transactions.

4,352,104

REMOTE METER READING APPARATUS

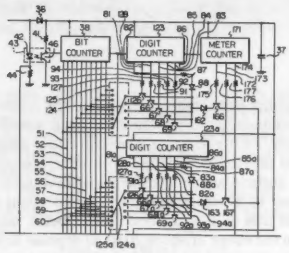
Toshiaki Mizuta; Takeshi Abe; Ichiro Yoshihara, and Kazuhito Saito, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

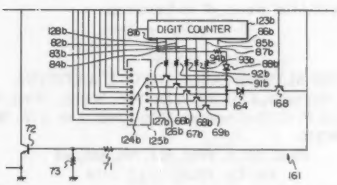
Filed May 5, 1980, Ser. No. 146,570

Claims priority, application Japan, May 7, 1979, 54-54753

Int. Cl.³ H04Q *9/06*; G08B *19/36*

U.S. Cl. 340—825.15 **11 Claims**





1. A remote meter reading apparatus comprising meter means, reading means located remotely from the meter means and communication line means connecting the reading means to the meter means, the reading means being constructed to feed clock pulses to the meter means, the meter means being constructed to feed a predetermined number of synchronization signals followed by a predetermined number of meter data signals followed by a predetermined number of redundancy signals to the reading means in response to and in synchronism with the clock pulses, the synchronization signals and the redundancy signals being different from each other.

4,352,105

DISPLAY SYSTEM

Robert C. Harney, Acton, Mass., assignor to Radiation Dynamics, Inc., Melville, N.Y.

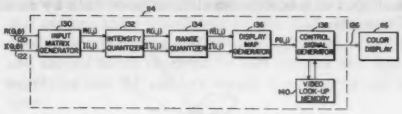
Filed Sep. 25, 1979, Ser. No. 78,793

Int. Cl.³ G01S *7/06*

U.S. Cl. 343—5 CD **6 Claims**

1. System for generating a control signal for controlling a color display to display signals representative of a first function f(i,j) and a second function g(i,j), where i and j are independent integer variables, comprising

A. g-quantizer means for grouping the values of g(i,j) into a predetermined number (N) of groups, each of said groups corresponding to a predetermined range of the values of g(i,j), each of said ranges corresponding to a first predetermined perceptual color characteristic, wherein said g-



quantizer includes means for generating a g-quantized matrix g'(i,j), where

$$g'(i,j) = \begin{cases} n & \text{, if } g(i,j) > T \text{ for } 1 \leqq n \leqq N \\ O & \text{, otherwise} \end{cases}$$

where g'(i,j) is an integer, T equals M&K·S, where M and S are the mode and standard deviation, respectively, of the frequency of occurrence of the respective values o g(i,j) and K is a predetermined constant, and for each (i,j), n is the integer for which the cumulative distribution function of the g values exceeding T evaluated at (i,j) is between

$$(n-1)\frac{M}{N} \text{ and } n\frac{M}{N},$$

where M is the maximum value of said cumulative distribution function,

B. f-quantizer means for grouping the values of f(i,j) into a predetermined number (H) of groups, each of said groups corresponding to a predetermined range of the values of f(i,j), each of said ranges corresponding to a second predetermined perceptual color characteristic, where said secnd predetermined perceptual color characteristic is substantially orthogonal to said first predetermined perceptual color characteristic, wherein said f-quantizer includes means for generating an f-quantized matrix f'(i,j), where

$$f'(i,j) = \begin{cases} \text{integer part}[H(f(i,j) - f_{MIN})/(f_{MAX} - f_{MIN}) + 1], \\ \text{for } f_{MIN} \leqq f(i,j) \leqq f_{MAX} \\ H \qquad \text{for } f(i,j) = f_{MAX} \end{cases}$$

wherein f'(i,j) is an integer, f_{MIN} is the minimum value of f(i,j) and f_{MAX} is the maximum value of f(i,j), and

c. display map generator means operative for each point (i,j) to generate said control signal P(i,j), where

$$P(i,j) = \begin{cases} 0 & \text{, if } g'(i,j) = 0 \\ I'(i,j) + N[f'(i,j) - 1], & \text{otherwise} \end{cases}$$

said control signal being representive of the first and second perceptual color characteristics f'(i,j) and g'(i,j), respectively, associated with f(x,y) and g(i,j) for that point.

4,352,106

RADAR REFLECTORS

John H. Firth, 15, The Gowers, Harlow, Essex, England

Filed Sep. 5, 1980, Ser. No. 184,237

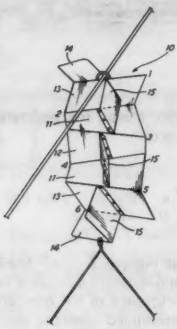
Claims priority, application United Kingdom, Sep. 17, 1979, 7932216

Int. Cl.³ H01Q *15/18*

U.S. Cl. 343—18 C **10 Claims**

1. A radar reflector comprising ten trihedral reflectors directed outwardly of a major axis the inner eight of which are formed in vertically displaced pairs of dihedral reflectors subdivided by a divider portion which reflectors are positioned such that the apexes of the two central dihedral reflectors are relatively displaced about the major axis by an angle a and the

apexes of the dihedral reflectors on each side of the central reflectors are displaced about the major axis relative to the nearest apex of a central dihedral reflector each by an angle



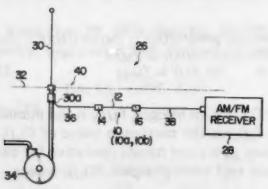
different to a, the arrangement being such that the reflectors cover the full azimuth of 360 degrees and the azimuthal spacing between adjacent central axes of reflection of the trihedral reflectors is in the range of 25 degrees to 45 degrees.

4,352,107

MATCHING CABLE FOR AUTOMOBILE ANTENNAS FOR RECEIVING FM BROADCASTS

Hisamaro Kiyooka, Kawasaki, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1981, Ser. No. 228,982
Claims priority, application Japan, Aug. 22, 1980, 55-115382
Int. Cl.³ H01Q *1/32*
U.S. Cl. 343—715 **2 Claims**



1. A matching cable for automobile antennas for receiving FM broadcasts comprising:

a first connector detachably connected to a first end of an antenna cable which comprises a coaxial cable and a second end of which is connected to an antenna element for automobiles functioning in cooperation with a receiver capable of receiving FM broadcasts;

a coaxial cable to one end of which is connected said first connector and having a length such the resistance components of the impedance of said antenna element side as viewed from the other end of said cable are substantially equal to the input impedance of said receiver, and the reactance components are inductive at substantially the central frequency of a frequency region in which the decrease in the VSWR as measured from said other end is desired, that is, at a specified frequency;

a second connector mounted to the other end of said coaxial cable and detachably connected to said receiver; and

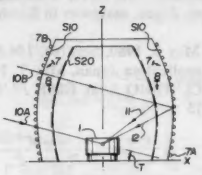
a capacitor encased inside said second connector, connected in parallel to both conductors of said coaxial cable, and having a capacitance such that the capacitive reactance at said specified frequency substantially cancels said inductive reactance.

4,352,108

ANTENNA BEAM SHAPING STRUCTURE EMPLOYING DIPOLES ARRAYED ON A PARABOLIC SURFACE

Robert Milne, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jul. 11, 1979, Ser. No. 56,507
Claims priority, application Canada, Aug. 9, 1978, 309005
Int. Cl.³ H01Q *19/12*
U.S. Cl. 343—756 **19 Claims**



1. An antenna beam shaping structure for receiving broadcast radio frequency energy from an earth satellite or other moving body whose bearing and elevation relative to the structure are subject to variation with time, comprising:

(a) a first surface which is a surface of revolution swept out by a part of a parabolic curve rotated about an antenna axis, the axis of the parabolic curve being inclined at an angle in the range of about 70 to 80 degrees to the antenna axis with the focus of the parabolic curve substantially on the antenna axis, and

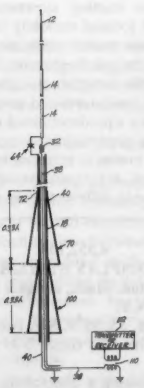
(b) a set of electrically isolated dipoles mounted on said surface and similarly oriented such that they lie along the edges of axial planes of said antenna.

4,352,109

END SUPPORTABLE DIPOLE ANTENNA

Donald K. Reynolds, 6365 Beach Dr. SW., Seattle, Wash. 98136, and Louis P. C. Smithmeyer, 12009 30th Ave. SW., Seattle, Wash. 98146

Filed Jul. 7, 1980, Ser. No. 165,845
Int. Cl.³ H01Q *1/52, 9/18*
U.S. Cl. 343—792 **14 Claims**



1. An end supportable, center driven, dipole antenna, comprising:

a conductive support mast having an outer end;

means at said outer end for electrically connecting said mast to a first conductor of an antenna circuit;

a conductive rod extending endwise outwardly from the

outer end of said support mast, said rod having an inner end;

means at said inner end for electrically connecting said rod to a second conductor of an antenna circuit;

dielectric connector means at the outer end of said support mast for connecting said rod and said mast together and electrically insulating each from the other; and

a continuous conductive generally conical sleeve of resonant length greater than one quarter wave length, said sleeve having a small diameter outer apex end which is both structurally and electrically connected to said mast, a large diameter inner mouth end which extends circumferentially about the mast and is spaced radially outwardly from the mast a distance sufficient to open-circuit the antenna at that location, and inner and outer surfaces, wherein the inner mouth of the sleeve is the inner extremity of the dipole, and wherein said sleeve is of a length sufficient to effectively serve as a coaxial transmission line of variable characteristic impedance on its inside and as a radiating element of the antenna on its outside.

4,352,110

METHOD FOR SITING COSINE-SQUARED ANTENNAS AND ANTENNA ARRAY OBTAINED THEREBY

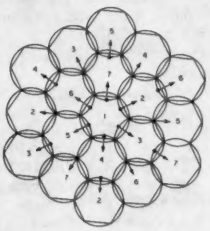
Dirk J. Braak, Heroldsberg, Fed. Rep. of Germany, assignor to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,483

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923088

Int. Cl.³ H01Q *21/06*

U.S. Cl. 343—844 **11 Claims**



1. A method for optimally siting cosine-squared antennas within a geographical area, in order to create an antenna array suitable for use with mobile transceivers moving within the area, comprising: superimposing a dense hexagonal cellular grid system with like hexagonal cells upon the area; circumscribing a circle around each such cell; classifying all cells and circles circumscribed thereabout into like hexagonal cell clusters; locating a center cell in each such cell cluster; locating a centerpoint within each such center cell; and on each circle within each cell cluster excluding a circle circumscribed about the center cell therein, determining a site point which is closest to said centerpoint, each site point being an optimum antenna site within the area upon which a cosine-squared antenna may be located.

4,352,111

MULTI-BAND ANTENNA COUPLING NETWORK

David J. Carlson, and Sander H. C. Tsou, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,587

Int. Cl.³ H01Q *19/06*

U.S. Cl. 343—860 **9 Claims**

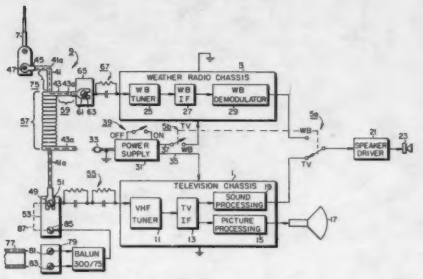
1. Apparatus comprising:

a single antenna for receiving RF carriers in both first and second different bands;

first and second tuners for tuning said RF carriers in respective ones of said first and second bands;

a first wire including a first conductor connected between said antenna and a signal input of said first tuner, said first conductor conducting said RF carriers in both of said first and second bands received by said antenna and thereby supplying said RF carriers in said first band to said first tuner;

a second wire including a second conductor having one end of connected to a signal input of said second tuner



and being wrapped around the first conductor in a predetermined number of discrete turns without D.C. connection to said first conductor or to said antenna to exhibit a frequency selective characteristic between said first and second conductors having a pass band including said second band and a rejection band including said first band for coupling said RF carriers in said second band from said first conductor to said second conductor and thereby serving to supply said RF carriers in said second band to said second tuner from said antenna while inhibiting said RF carriers in said first band from being diverted from said first tuner to said second tuner.

4,352,112

REFLECTOR WITH AIR PRESSURE MEANS

Fritz Leonhardt; Wolfhart Andra; Wilhelm Zellner, and Jörg Schlaich, all of Lenzhalde 16, D-7000 Stuttgart 1, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,159

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740813

Int. Cl.³ H01Q *15/20*

U.S. Cl. 343—915 **21 Claims**

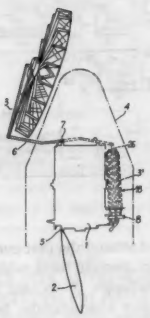
1. A reflector for use as an antenna, solar mirror, or the like comprising a concave membrane having a concave reflector surface, said membrane having been initially flat, said membrane being of a material that in its initial flat state is capable of being deformed in all directions in its plane, and said membrane being permanently deformed to its concave shape by stretching beyond its elastic limit.

4,352,113

FOLDABLE ANTENNA REFLECTOR

Gilles Labruyere, Mandelieu, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jun. 26, 1981, Ser. No. 277,857
Claims priority, application France, Jul. 11, 1980, 80 15527
Int. Cl.[3] H01Q *15/20*
U.S. Cl. 343—915 12 Claims



1. An antenna reflector comprising a supple reflecting dish, and

a collapsible, rigid support structure supporting said dish, said structure comprising:

a central base;

a plurality of elongated frame elements radially distributed about said base, one end of each of said elements being articulated to said base about an axis tangential to a circle in a plane perpendicular to the axis of reflection of said dish, said frame elements being movable between a collapsed position generally parallel to said axis of the dish and an extended position transverse thereto;

a plurality of arms, each of which has one free end and one end articulated to the other end of a frame element, each arm being movable from a first position in which it projects angularly with respect to its associated frame element and a second position in which it is folded adjacent the side of said frame elements facing said axis of the dish;

means for moving said frame elements between said collapsed and extended positions;

means for causing said arms to assume said first position when said frame elements are extended and said second position when said frame elements are collapsed;

means for connecting the periphery of said dish to the free ends of said arms;

means including tensioning members extending between said dish and said frame elements for causing said dish to assume a desired configuration when said frame elements are extended;

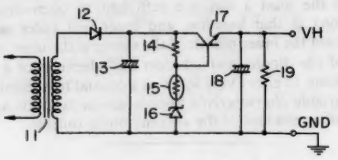
said frame elements, when collapsed, forming a generally tubular bundle of relatively small diameter enclosing said supple dish.

4,352,114

INK JET PRINTER WITH TEMPERATURE COMPENSATION

Hiroshi Kyogoku, Kawasaki; Shigemitsu Tazaki, Matsudo; Shigeru Okamura, Yokohama; Koji Terasawa, Mitaka; Yukio Kasugayama, Yokohama, and Yoshihumi Hattori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,348
Claims priority, application Japan, Oct. 23, 1979, 54-135917
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—140 R 2 Claims



1. An ink jet printer for ejecting a single ink droplet in response to each applied input pulse, said ink jet printer comprising:

an ink chamber for storing ink therein;

an electrostriction element for effecting a change of capacity of said ink chamber;

a temperature sensitive element for sensing the temperature of ambient atmosphere; and

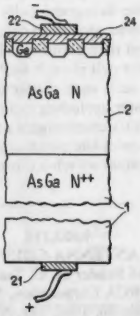
curcuit means responsive to each input pulse applied thereto for straining said electrostriction element causing ejection of only one ink droplet from said ink chamber for each applied input pulse, wherein said circuit means varies the degree of strain of said electrostriction element in accordance with the temperature sensed by said temperature sensitive element.

4,352,115

TRANSIT TIME DIODE WITH AN INPUT STRUCTURE FORMED BY A MATRIX OF MICROPOINTS

Paul C. Moutou, and Jacques Montel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 969,314, Dec. 14, 1978, abandoned, which is a continuation of Ser. No. 806,542, Jun. 14, 1977, abandoned. This application Aug. 25, 1980, Ser. No. 180,979
Claims priority, application France, Jun. 15, 1976, 76 18122
Int. Cl.[3] H01L *29/90*
U.S. Cl. 357—13 1 Claim



1. A transit time diode comprising:

a substrate of gallium arsenide material with a high N+ doping;

a first layer of gallium arsenide formed on said substrate, said

first layer having an N doping less than said N+ doping of said substrate and forming a matrix of microscopic pits situated on the side of said first layer opposite to said substrate, said pits having a diameter of 0.5 to 15.0 micrometers;

a second layer of dielectric material formed on said first layer, said second layer having a matrix of microscopic holes exactly superimposed over said pits;

a matrix of germanium deposits situated in said pits;

a third layer of a metal penetrating to said germanium deposits through said holes, and wherein

said first layer has a predetermined thickness suitable to allow development of the avalanche phenomenon and the transit of electrons over a length corresponding to a desired transit time.

4,352,116

SOLID STATE ELECTRO-OPTICAL DEVICES ON A SEMI-INSULATING SUBSTRATE

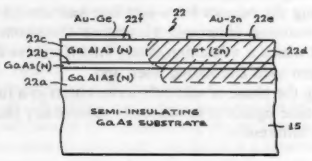
Amnon Yariv, San Marino; Shlomo Margalit, and Chien-Ping Lee, both of Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 926,649, Jul. 21, 1978, Pat. No. 4,212,020. This application Mar. 17, 1980, Ser. No. 130,990

The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.

Int. Cl.³ H01L *33/02*

U.S. Cl. 357—17 **20 Claims**



1. A circuit structure comprising:

a layer of semi-insulating matter forming a substrate with a top surface;

n semi-conductor layers successively grown on said substrate and forming a single crystal, with said substrate having lattice matching parameters to those of the layer grown on the top surface of said substrate, $n>1$, with adjacent layers, when $n>1$, being characterized by different electrical properties; and

first and second contacts on said single crystal which includes said n layers, whereby both said contacts are on the same side of said substrate.

4,352,117

ELECTRON SOURCE

Jerome J. Cuomo, Lincolndale; Russell W. Dreyfus, Mount Kisco, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,729

Int. Cl.³ H01L *27/14*

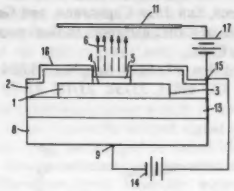
U.S. Cl. 357—30 **10 Claims**

1. An electron source comprising in combination:

a p-type gallium arsenide semiconductor region in which hole-electron pairs can be generated, said region having the property of a specific electron diffusion length,

an electron barrier layer of gallium aluminum arsenide on at least a portion of the surface thereof, said barrier layer having an emission opening exposing a portion of the surface of said semiconductor region,

a negative electron affinity material in contact with the exposed surface of said emission opening, and



means for generating hole electron pairs in said semiconductor region.

4,352,118

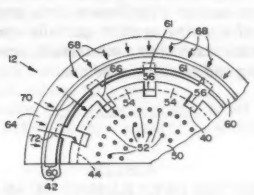
THYRISTOR WITH SEGMENTED TURN-ON LINE FOR DIRECTING TURN-ON CURRENT

Victor A. K. Temple, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 16,899, Mar. 2, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,855

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **8 Claims**



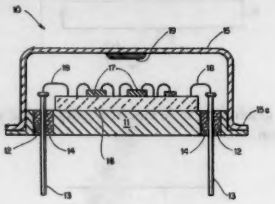
1. A thyristor comprising: a semiconductor body having at least four zones of alternate conductivity type, including an emitter zone of a first conductivity type, a base zone of a second conductivity type forming a junction with said emitter zone, said junction intersecting a surface of said body to define an emitter boundary, an emitter electrode in contact with said emitter zone and extending beyond said emitter boundary and into contact with said base zone at a plurality of locations spaced along said emitter boundary to form a plurality of boundary shorts, the portions of said emitter boundary between said boundary shorts forming turn-on segments, said boundary shorts being formed over a substantial majority portion of said emitter boundary relative to said turn-on segments to provide relatively high dV/dt capability, a gate current source including a gate electrode for supplying carriers to said base zone, and means for directing carriers supplied by said gate current source to said turn-on segments including a continuous gate barrier region of said first conductivity type adjacent said base zone and opposite and substantially coextensive with said emitter boundary and carrying said gate electrode, said gate barrier region serving to substantially block gate current from passing between said gate electrode and said base zone, portions of said gate electrode being in contact with said gate barrier region and other portions of said gate electrode contacting said base zone at a plurality of separate locations generally aligned with said turn-on segments for directing carriers supplied by said gate electrode substantially only to said turn-on segments to provide a shortened turn-on line for increased gate sensitivity.

4,352,119

ELECTRICAL DEVICE AND METHOD FOR PARTICLE ENTRAPMENT DEVICE FOR AN ELECTRICAL COMPONENT

William H. Bardens, San Juan Capistrano, and Gale C. Nelson, Mira Loma, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 17, 1979, Ser. No. 75,864
Int. Cl.[3] H01L 23/36, 23/02, 23/12
U.S. Cl. 357—78 7 Claims



1. An electrical device comprising:

(a) an operational element for performing an electrical function;

(b) package means for containing said operational element;

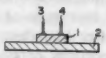
(c) a particle getter disposed within said package means for entrapping and retaining particles within said package means, said particles getter comprising the reaction product of an organo polysiloxane resin and an effective amount of a curing agent to partially cure said organo polysiloxane material to a substantially non-flow, particle entrapping and retaining condition.

4,352,120

SEMICONDUCTOR DEVICE USING SIC AS SUPPORTER OF A SEMICONDUCTOR ELEMENT

Yasutoshi Kurihara, Katsuta; Hiroaki Hachino, and Kousuke Nakamura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,778
Claims priority, application Japan, Apr. 25, 1979, 54-50348
Int. Cl.[3] H01L 23/02, 23/48, 29/44
U.S. Cl. 357—81 9 Claims



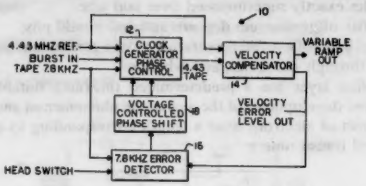
1. A semiconductor device comprising at least one semiconductor element and a supporter of silicon carbide, wherein said element is mounted on said supporter and said supporter is a sintered body including therein one or more of Al, Al_2O_3, Fe and Si.

4,352,121

PAL BURST PHASE SHIFT ERROR CORRECTOR

Martin A. Lilley, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1980, Ser. No. 138,464
Int. Cl.[3] H04N 5/795
U.S. Cl. 358—326 11 Claims



1. A method for eliminating phase error between alternating PAL subcarrier reference bursts in a time varying video signal reproduced from a record medium by a plurality of transducers, comprising the steps of:

removing the 90° phase shift between subcarrier bursts on successive lines;

sensing the line velocity error in said phase shifted bursts for each such line;

sampling and retaining in a first unit said velocity error occurring on first alternate lines;

sampling and retaining in a second unit said velocity error occurring on opposite alternate lines;

combining the outputs from said first and second sampling and retaining units and generating therefrom a phase signal which is a function of any 7.8 kHz phase difference between such alternating lines; and

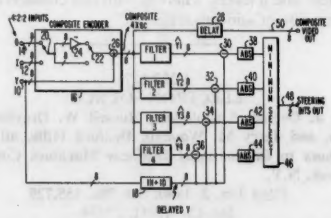
adjusting the phase of said subcarrier bursts as a function of said phase signals to substantially remove any said 7.8 kHz phase difference.

4,352,122

ADAPTIVE COMPOSITE-COMPONENT TRANSCODING HIERARCHY FOR DIGITAL VIDEO

Glenn A. Reitmeier, Trenton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,613
Int. Cl.[3] H04N 9/42, 9/38, 9/535
U.S. Cl. 358—11 16 Claims



1. A method comprising forming a composite video signal from component video signals, transmitting samples of said composite video signal, and transmitting a control signal indicative of which of combinations of surrounding samples of said transmitted samples has a component that provides the closest match to the corresponding component of the original component video signals.

4,352,123

COLOR-TELEVISION RECEIVER HAVING INTEGRATED CIRCUIT FOR THE LUMINANCE SIGNAL AND THE CHROMINANCE SIGNALS

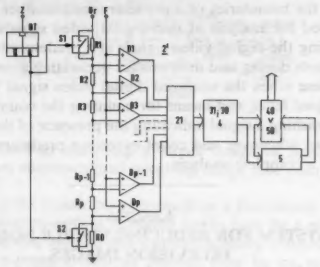
Peter M. Flamm, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,187

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015141

Int. Cl.³ H04N 9/50

U.S. Cl. 358—23 **1 Claim**



1. A color-television receiver comprising at least one integrated circuit for separating and conditioning the luminance signal and the chrominance signals from the composite color signal, said integrated circuit containing:

a chrominance-subcarrier oscillator,

a chrominance-subcarrier band-pass filter,

a synchronous demodulator,

a PAL switch,

a color matrix, and, if necessary,

an R—G—B matrix, and being characterized by the following subcircuits for conditioning digital signals:

the chrominance-subcarrier oscillator is a squarewave clock generator providing four clock signals the first of which has four times the chrominance-subcarrier frequency and the second to fourth of which have the chrominance-subcarrier frequency, with the first and second clock signals having a pulse duty factor of 0.5, and the third and fourth clock signals each consisting of two consecutive, T/2-long pulses separated by T/2 within each 4T-long period (T=period of the first clock signal);

an analog-to-digital converter clocked by the first clock signal, whose analog input is presented with the composite color signal, and which forms as its output signal a parallel binary word from the amplitude of the composite color signal (F) at the instants the respective amplitudes of the undemodulated chrominance signal are equal to the amplitudes of the respective color-difference signal;

a first binary arithmetic stage which multiplies the output signal of the analog-to-digital converter by a binary overall-contrast control signal;

a two-stage delay line which delays the output signal of the first binary arithmetic stage by T/2;

a second binary arithmetic stage which forms the arithmetic mean of the delayed and undelayed output signals of the first binary arithmetic stage;

a third binary arithmetic stage which subtracts the output signal of the second binary arithmetic stage from the output signal of the first delay stage;

a buffer-memory arrangement which temporarily stores the output signal of the third binary arithmetic stage, and whose enable input is fed with the third clock signal;

a shift-register arrangement consisting of n parallel shift registers (n=number of bits at the output of the third binary arithmetic stage) each of which provides a delay of one line period and whose serial inputs are connected to the parallel outputs of the buffer-memory arrangement, while their clock inputs are fed with the fourth clock signal;

a fourth binary arithmetic stage which forms the arithmetic mean of the input and output signals of the shift-register arrangement;

a fifth binary arithmetic stage which subtracts the input signal of the shift-register arrangement from the output signal of this arrangement and then divides the difference by two;

a sixth binary arithmetic stage which, controlled by the PAL switch, either leaves the output signal of the fifth binary arithmetic stage unchanged or forms its absolute value;

a seventh binary arithmetic stage which forms the green color-difference signal from the output signals of the fourth and sixth binary arithmetic stages;

the outputs of the second, fourth, sixth and seventh binary arithmetic stages are connected to the binary R-G-B matrix each of whose outputs is coupled to one of three digital-to-analog converters for deriving the analog signals for controlling the R-G-B values of the picture tube, or

the outputs of the second, fourth, sixth and seventh binary arithmetic stages are each connected to one of four digital-to-analog converters for deriving the analog signals for controlling the color-difference value of the picture tube;

the improvement wherein

the analog-to-digital converter is a parallel analog-to-digital converter with $p=2^r-1$ differential amplifiers as comparators, where r is the number of binary digits of the output signal of the analog-to-digital converter minus one, the composite color signal being applied as the input signal to one of the noninverting or inverting inputs of all p differential amplifiers and the other of the inverting or noninverting inputs of the differential amplifiers being connected successively to the taps of a resistive voltage divider which contains equal-value resistors and is fed with a reference voltage (Ur), and

for the duration of every second line, either the reference voltage (Ur) or the input signal (F) is shifted by $\Delta U=0.5\ Ur/2^r$.

4,352,124

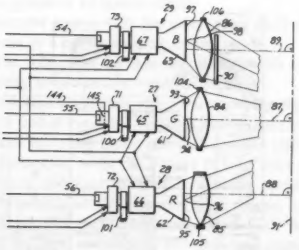
AIRCRAFT PASSENGER ENTERTAINMENT SYSTEM

Donald D. Kline, Newport Beach, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 27, 1978, Ser. No. 955,721

Int. Cl.³ H04N 9/31

U.S. Cl. 358—60 **34 Claims**



1. In a method of displaying color video pictures to passengers aboard an aircraft with the aid of a first imaging device for presenting a first one of three complementary color component images in a first image display field, said first image display field having a first center, a first projecting device including a first lens for projecting said first image from said first field onto a screen, said first lens having a first lens axis, a second imaging device for presenting a second one of said color component images in a second image display field, said second

image display field having a second center, a second projecting device including a second lens for projecting said second image from said second field onto said screen, said second lens having a second lens axis, a third imaging device for presenting the third of said color component images in a third image display field, said third image display field having a third center, and a third projecting device including a third lens for projecting said third image from said third field onto said screen, said third lens having a third lens axis, the improvement comprising in combination the steps of:

mounting said screen in a first plane;

disposing said first image display field in a plane parallel to said first plane;

disposing said second image display field in a plane parallel to said first plane;

disposing said third image display field in a plane parallel to said first plane;

disposing each of said first, second and third lens axes perpendicularly to said first plane;

providing a closer spacing between said second and third axes of said second and third lenses than between said second and third centers of said second and third image display fields;

omitting marginal portions of at least some of said first, second and third lenses to precorrect spatial rightness variations in the color video picture;

providing three complementary color component image signals for composing via said first, second and third imaging and projecting devices a color video picture;

applying said three complementary color component signals respectively to said first, second and third imaging devices for providing said first, second and third color component images respectively in said first, second and third image display fields; and projecting said provided first, second and third color component images respectively with said first, second and third projecting devices, including said first, second and third lenses, onto said screen for composite viewing of said color video picture by said passengers.

4,352,125
RECOGNITION APPARATUS

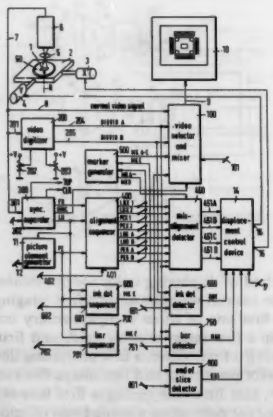
Friedrich Guth, Freising, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Fed. Rep. of Germany

Division of Ser. No. 948,064, Nov. 29, 1978, abandoned. This application Jan. 28, 1980, Ser. No. 115,659

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803653

Int. Cl.³ H04N 7/18

U.S. Cl. 358—101 **12 Claims**



1. Apparatus for recognizing the presence of an identification area having a first reflection characteristic on a background surface of an object having a second reflection characteristic, comprising television camera means operable to generate an electrical video signal representative of a video image of a surface area of the object containing the identification area; digitizing means for receiving the video signals and forming therefrom digital video signals having two signal levels which for the video signals originating from the background area have predominantly a first signal level and for the video signals originating from the identification area have predominantly a second signal level; marker generator means operable under control of control signals for generating marker signals which define the boundaries of a predetermined number of intervals provided for analysis of said digital video signals; means for analyzing the digital video signals at a predetermined number of instants during said intervals for generating a count pulse in each case when the analyzed digital video signal has the second signal level; and means for counting the count pulses and for furnishing a signal indicating the presence of the identification area whenever said count exceeds a predetermined value during a complete analysis.

4,352,126
SYSTEM FOR REDUCING VISIBLE NOISE IN TELEVISION IMAGES

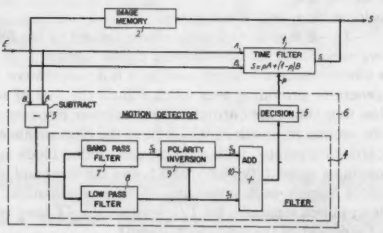
Jacques Poncin, 11 boulevard Volney, 35000 Rennes; Pierre Rogel, 14, rue Gould'oeuvre, 35690 Acigne, and Maurice Remy, 5 avenue Erlanger, 75016 Paris, all of France

Filed Aug. 11, 1980, Ser. No. 177,012

Claims priority, application France, Aug. 16, 1979, 79 21201

Int. Cl.³ H04N 5/21

U.S. Cl. 358—167 **8 Claims**



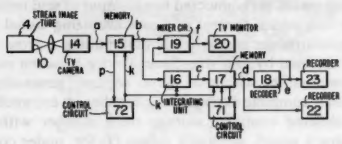
1. A motion detector system for reducing visible noise in television images responsive to a numerical treatment of a video signal, said system comprising numerical time filter means, sample memory means coupled to the output of the time filter means, means in said time filter for combining a sample of video image signals to be treated with a corresponding sample signal delivered by the memory means, threshold-type decision circuit means for determining the combination parameter of the time filter, a subtraction circuit means having one input coupled to receive the image sample to be treated and a second input coupled to receive the corresponding sample delivered by the sample memory means, low-pass filter means and band-pass filter means having parallel inputs for receiving samples delivered by said subtracting means, and means for giving sign outputs in response to said band-pass and low-pass filter means, polarity reversal circuit means including an exclusive OR circuit means, said sign outputs being coupled to two inputs of said exclusive OR circuit means, said polarity reversal circuit means being responsive to said two filter means and controlled by said OR circuit means, adding means jointly responsive to the low-pass filter means and said polarity reversal circuit means, the output of said adding means being connected to said threshold-type decision circuit means, and said polarity reversal means executing a polarity reversal when the values of the inputs of the exclusive OR circuit are different.

4,352,127

METHOD AND APPARATUS FOR ANALYZING STREAK IMAGE OF LIGHT PULSE FORMED ON ELECTRO-OPTICAL STREAKING IMAGE TUBE

Yutaka Tsuchiya, Hamamatsu, Japan, assignor to Hamamatsu TV Co., Ltd., Hamamatsu, Japan

Filed Dec. 26, 1979, Ser. No. 107,181
Claims priority, application Japan, Dec. 27, 1978, 53-163329
Int. Cl.³ H04N *5/34*
U.S. Cl. 358—217 **6 Claims**



1. A method of analyzing a streak image of light pulse formed on an electro-optical streaking image tube comprising the steps of:

picking up the streak image formed on a fluorescent screen of the electro-optical streaking image tube by a progressive scanning method that employs as many scanning lines as are n-times greater in number than in the standard scanning method, using a television camera;

storing the picked up video signals in a picture memory unit by the progressive scanning method so that the streak image is kept two-dimensionally;

reading out the stored video signals by the 2n:1 interlaced scanning for integration by scanning line;

storing the integrals at addresses corresponding to the order to the scanning lines; and

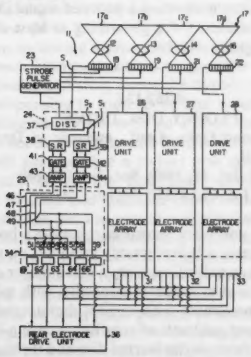
inputting the integrals read out in the order of address, on completion of the storing of the integrals for all scanning lines, in means for displaying and/or recording which displays and/or records the waveform of the light pulse.

4,352,128

COMBINATION ELECTROSTATIC COPYING MACHINE AND FACSIMILE TRANSCEIVER

Tamio Ohori; Fuyuhiko Mastumoto, and Satoru Tomita, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,295
Claims priority, application Japan, Jul. 14, 1977, 52-84461
Int. Cl.³ H04N *1/18, 1/22*
U.S. Cl. 358—294 **8 Claims**



1. A reproduction apparatus comprising:

optoelectronic sensor means for scanning a linear portion of an original document, the sensor means comprising N linear photosensor arrays arranged in a row, each photosensor array comprising M photosensor elements, N and M being integers;

strobe means; and

printing means for receiving the output signals of all of the photosensor arrays and forming marks on a reproduction medium corresponding thereto, and;

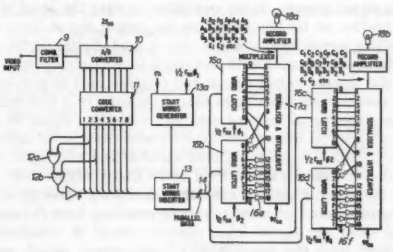
control means for controlling the strobe means to selectively apply M strobe pulses to all of the N photosensor arrays simultaneously for printing or to apply N groups of M strobe pulses each to the N photosensor arrays respectively in sequence for transmission, the strobe means sequentially applying M strobe pulses to the M photosensor elements respectively in the arrays, the photosensor elements producing output signals in response to the respective strobe pulses.

4,352,129

DIGITAL RECORDING APPARATUS

John L. E. Baldwin, Eastleigh, England, assignor to Independent Broadcasting Authority, London, England

Filed Feb. 1, 1980, Ser. No. 117,511
Int. Cl.³ H04N *5/78;* H03K *13/24*
U.S. Cl. 360—32 **4 Claims**



1. Digital recording apparatus, comprising

(a) analogue to digital converter means (**10**) for converting an analogue signal to a plurality of digital words each including a plurality of binary digits;

(b) code converter means (**11**) for converting each of said digital words to a corresponding coded word;

(c) means (**12***a*, **12***b*, **12***c*) for inserting a parity bit in each word, thereby to produce a resultant word;

(d) start word inserter means (**13***a*) for inserting within a series of the coded resultant words a digital start word;

(e) latch means including pairs of word latches (**16***a*, **16***b*; **16***c*, **16***d*) connected with the output of said start words inserter means, one latch of each pair being operable to pass a word exactly as it enters the latch means, and the other latch of that pair being associated with inserter means and operable to produce the ones complement of the word entering the latch, whereby a first word supplied to one latch exits that latch in the identical condition, and a second word supplied to the companion latch exits that latch in the ones complement condition;

(f) serializing and interleaver means (**17***a*, **17***b*) for at least partially interleaving the bits of the first word with the ones complemented bits of the second word;

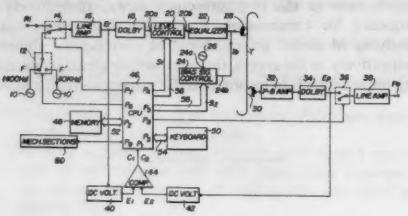
(g) means for combining the outputs of said latch means; and

(h) means (**19***a*, **19***b*) for recording the interleaved combined words in a recording medium.

4,352,130
MAGNETIC SOUND RECORDER HAVING COMPUTER-CONTROLLED ADJUSTING DEVICE

Tsunao Hasegawa, and Yasushi Ohtake, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 14, 1979, Ser. No. 93,986
Claims priority, application Japan, Nov. 14, 1978, 53-140701
Int. Cl.³ G11B *5/47*
U.S. Cl. 360—66 **6 Claims**



1. A magnetic tape sound recorder including a computer-controlled device for automatically adjusting the recording signal level and the level of the bias current to be superposed on the recording signal, wherein the improvement comprises sources of first and second recording signals having different frequencies, a recording signal level control circuit operative to vary the signal level of the recording signal supplied thereto, a bias signal control circuit operative to vary the level of the bias current to be impressed on the output signal from said recording signal level control circuit, and digital signal processing means coupled with said signal level control circuit and said bias signal control circuit and programmed to provide at least two consecutive cycles each consisting of a first step of varying the signal level of said first recording signal in said recording signal level control circuit with the level of said bias current fixed at a predetermined value in said bias signal control circuit until the signal level of the output signal delivered from the signal level control circuit reaches a value at which the signal level of the playback signal resulting from the output signal from the signal level control circuit is substantially equalized with the signal level of said output signal, and a second step of varying the level of said bias current in said bias signal control circuit with the signal level of the second recording signal fixed at said value of the signal level of said output signal until the signal level of the playback signal resulting from the output signal from the recording signal level control circuit is substantially equalized with the signal level of said output signal.

4,352,131
MEMORY DISC ADDRESSING DEVICE

Alfred Van Herk, Eindhoven; Jacob A. M. Buis, The Hague; Jan H. Klijnstra, The Hague, and Jan Van Staalduinen, The Hague, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

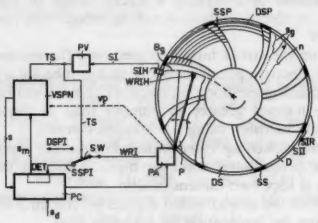
Filed Feb. 29, 1980, Ser. No. 126,077
Int. Cl.³ G11B *21/08, 21/10*
U.S. Cl. 360—78 **8 Claims**

1. A device for recovering a storage track number of a storage track present on a disc-shaped and rotatable record carrier, said storage track being aligned with a transducer device provided on a positioning member for being cross-track positionable, wherein the record carrier comprises a first plurality of groups of storage tracks being divided into alternate data tracks and servo tracks, the record carrier thereby being divided into alternate sectors of data tracks (DS) and servo tracks (SS), and wherein each servo track comprises the in-group number of the associated storage track within its grup of storage tracks, said device comprising:

indicator means (**1**) for indicating a validated complete storage track number composed of an in-group storage track number and a group number; read means (SW) connected to said transducer device for, upon encountering a servo track, reading the in-group storage track number (SM) therefrom, said read means having an output connected to said indicator means, for thereto forwarding a preliminary in-group storage track number as read most recently;

synchronizer means (PV) for, upon said transducer device encountering a servo track, generating a synchronizing signal (TS);

estimating means (**4**) connected to an output of said indicator means for, under control of a synchronizing signal from said synchronizer means while determining a cross-track speed attained by said transducer device between successive encounters with two servo sectors, generating an estimated complete storage track number by extrapolating the validated complete storage track number with said cross-track speed, generator means (**1**) for, under control of a synchronizing signal, generating a sequence of at least



one preliminary group number and having an output connected to said indicator means for thereto forwarding a preliminary group number as generated most recently thereby,

difference determining means (**3**) connected to an output of said indicator means and to an output of said estimating means for determining the difference between an estimated complete storage track number and a preliminary group number and a preliminary in-group storage track number;

comparator means (**5**) connected to an output of said difference determining means for comparing said difference with a quantity equal to half said second plurality and for, under control of a smaller difference, generating a validating signal (VOK) to said indicator means with a stop signal to said generator means, but under control of a larger difference generating a proceed signal (VNOK) to said generator means, for generating at least one further preliminary group number.

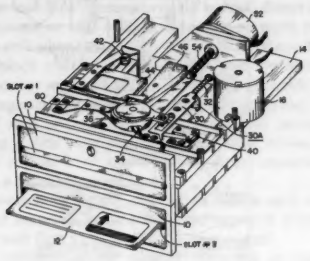
4,352,132
FLOPPY DISC DRIVE

Koko Gyi, Thousand Oaks, Calif., assignor to Data Master, Carmarillo, Calif.

Filed Jul. 18, 1980, Ser. No. 170,100
Int. Cl.³ G11B *5/016, 3/62*
U.S. Cl. 360—97 **7 Claims**

1. A disc drive unit for a record disc having a hole therein, comprising: a chassis; a hub rotatably mounted on the chassis for rotation about an axis of rotation; a drive motor coupled to the hub; an inertial disc mounted coaxially with said hub for relative angular movement with respect thereto and for rotation therewith about said axis of rotation; a spring-loaded pin extending axially through the inertial disc and through the hub in a position displaced radially from the axis of rotation of the hub and of the inertial disc, said pin being locked in a retracted position by said inertial disc and released to an extended position with respect to the surface of the hub upon relative angular movement of the hub and the inertial disc; an end wall

having a slot for receiving the record disc; and a switch mounted on the chassis in the path of said record disc to be actuated by the record disc upon the insertion thereof into said slot, said switch serving to energize the drive motor to cause said hub to turn and said inertial disc to release said pin so that



the pin extends through the hole in the record disc in a position displaced from the center of said hole and adjacent to the rim thereof and turns around the rim as said hub turns about said axis of rotation to center the record disc with respect to the axis of rotation.

4,352,133

MAGNETIC DISC MEMORY

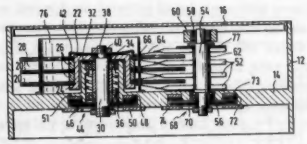
Horst Hager, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 922,735, Jul. 7, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 236,970

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732432

Int. Cl.³ G11B *21/08, 5/60*

U.S. Cl. 360—106 **8 Claims**



1. A magnetic disc memory comprising a plurality of circular magnetic storage discs which are arranged axially spaced from one another on a shaft directed at right angles to the disc plane, a first drive means to drive the shaft, a plurality of swivel arms mounting a plurality of magnetic heads to record and play back information onto or from the magnetic storage discs, the heads including means for dynamic air-spacing from the discs responsive to high speed disc rotation, means pivotally mounting the swivel arms on a pivot for common swivel movement about an axis spaced from and substantially parallel to the shaft axis, so that a swivel arm can be swung in an arcuate path across the disc plane immediately adjacent thereto to position said magnetic heads between two adjacent magnetic storage discs to record and play back information on various tracks thereon, and a second drive means to swing the swivel arms, each of said swivel arms over the portion thereof which extends into the region adjacent the storage discs being constructed of spaced apart upper and lower planar walls of rigid material which extend parallel to one another and to the disc planes, said spaced apart walls being joined at the leading edge thereof by a semicircular wall portion and being joined at the trailing edge thereof by a wall portion to produce a hollow, lightweight body having a symmetrical aerodynamic surface thereby to minimize the weight and air resistance of said portion, the spacing between said upper and lower planar walls being reduced to substantially zero over the terminal end portions thereof remote from said pivot, and means securing the magnetic heads to the respective swivel arms at the terminal ends thereof opposite the pivot.

4,352,134

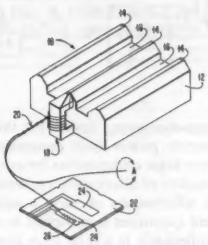
MAGNETIC HEAD ASSEMBLY WITH CORROSION RESISTANT CONDUCTIVE WIRE

Terry A. Burns, Milpitas, Calif., and Leslie H. Johnston, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,282

Int. Cl.³ G11B *5/20*

U.S. Cl. 360—123 **4 Claims**



1. In a bidirectional accessing magnetic head assembly characterized by:

a transducer core for bidirectional movement during accessing by said head assembly;

a coiled wire coupled to said core for moving bidirectionally with said transducer core;

the improvement wherein said wire is formed from a zirconium-copper alloy core;

a layer of conductive metal deposited over said alloy core;

an insulator coating surrounding said metal layer; and

a circuit assembly attached to said wire by means of a fluxless solder reflow termination connection.

4,352,135

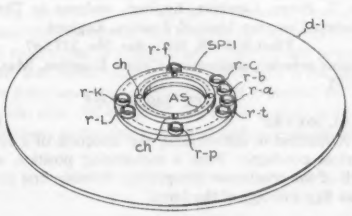
FLOPPY PACK WITH IMPROVED SPACER MEANS

Dean DeMoss, Camarillo, and Harvey J. Richardson, Sepulveda, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 3, 1980, Ser. No. 156,197

Int. Cl.³ G11B *23/02, 5/016*

U.S. Cl. 360—133 **21 Claims**



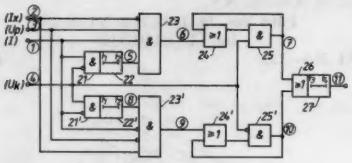
1. In an improved pack of flexible disks adapted to be pneumatically partitioned axially and wherein the disks are formed with gas-conducting apertures therethrough, the combination therewith of:

rim means disposed in each gap between respective disks and adapted to isolate the gap from the gas stream passing axially-up certain of said holes and also to provide a reference platform against which the disks may be pressed.

4,352,136
IMPEDANCE-MEASURING DEVICE FOR IMPEDANCE PROTECTION

Leif Ericksson, Sala, Sweden, assignor to Asea Aktiebolag, Vasteras, Sweden

Filed Aug. 26, 1980, Ser. No. 181,656
Claims priority, application Sweden, Aug. 30, 1979, 7907212
Int. Cl.³ H02H 3/26
U.S. Cl. 361—80 6 Claims



1. An impedance-measuring device for the impedance protection of an electric power line, comprising a comparator means built up from logic components for comparing the phase positions of a plurality of alternating current quantities which together contain information of such a nature that a phase comparison of said quantities is sufficient to obtain a criterion of whether the impedance in a fault loop lies inside or outside certain limits of an impedance zone which are defined by means of a model impedance, $Z_k=R+jX$; said alternating current quantities being transformed into signals containing only polarity information, said signals each being supplied to an input of at least one comparator means which is adapted to supply a specified output signal only when the supplied signals constitute a combination of logic levels for which the impedance of the fault loop lies inside said limits, one of said signals corresponding to the current I in the fault loop, each of said comparator means comprises a first, a second and a third logic component; and that one of the inputs of said second logic component is connected via a delay element to the output of said first logic component; and that the input side of said first logic component is supplied with a signal corresponding to $U_k=IZ_k-U$, where U is the voltage of the fault loop, and with said I-signal; and further that said I-signal and a signal corresponding to IX are supplied to respective inputs of said second logic component; and that said third logic component has an input to which said U_k-signal is supplied as well as an input which is supplied with a signal which is derived from the output signal of said second logic component.

4,352,137
METHODS AND APPARATUS FOR FAULT DETECTION

Allan T. Johns, Corsham, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 25, 1981, Ser. No. 237,867
Claims priority, application United Kingdom, Mar. 1, 1980, 8007051
Int. Cl.³ H02H 3/18
U.S. Cl. 361—82 16 Claims

1. A method of determining the direction of a fault on an electrical conductor from a monitoring position along the length of the conductor comprising: forming first and second signals S_{1R} and S_{2R} of the form:

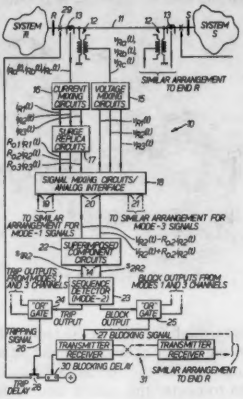
$$S_{1R}=K_1V_{f\!f}(t)-K_2Ri_R(t)$$

$$S_{2R}=K_3V_{f\!f}(t)+K_4Ri_R(t)$$

where

$V_{f\!f}(t)$ is a signal proportional to the difference between the steady-state voltage and the instantaneous voltage on the conductor at the monitoring position;

$Ri_R(t)$ is a signal proportional to the product of the difference between the steady-state current and the instantaneous current on the conductor at the monitoring position and a constant (R) which is related to the surge impedance of the conductor; and each of

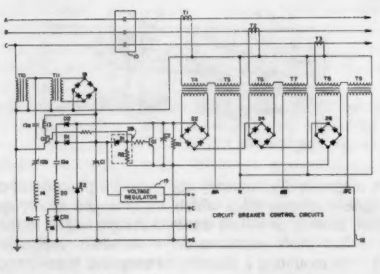


K_1,K_2,K_3 and K_4 is a positive or negative constant; and determining the sequence in which the signals S_{1R} and S_{2R} vary from selected values, and thereby the direction of the fault.

4,352,138
BACKUP TRIP CIRCUIT FOR A CIRCUIT BREAKER

Clyde Gilker, South Milwaukee, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Nov. 25, 1980, Ser. No. 210,318
Int. Cl.³ H02H 3/24
U.S. Cl. 361—92 12 Claims



1. In a circuit breaker for a protected alternating electric circuit which includes separable contacts, operating means for opening and closing said contacts, a trip coil for actuating said operating means to open said contacts when said trip coil is energized, a trip switch which is rendered conductive by a triggering signal for energizing said trip coil from a normal direct current power source, a normal trip control circuit energized from said normal direct current power source and coupled to said protected circuit for generating said triggering signal for said trip switch upon the occurrence of a predetermined overcurrent condition in at least one phase of said protected circuit, and said normal direct current power source, a combination backup trip control circuit and direct current power source comprising:

current sensing means coupled to said protected circuit, for producing a direct current signal having an instantaneous peak value each half cycle proportional to the instantaneous peak value of the maximum phase current of said protected circuit;

a resistor-capacitor network, connected across said current

sensing means to receive said direct current signal, and comprising at least one capacitor and one resistor connected across said capacitor;

rectifier means disposed between the series combination of said trip coil and said trip switch and both said normal power source and said resistor-capacitor network, to allow current flow from either said normal direct current power source or said resistor-capacitor network through said trip coil when said trip switch is rendered conductive, but to block current flow between said normal direct power source and said resistor-capacitor network;

a first voltage sensing means, connected to sense the voltage level of said normal direct current power source, for actuating a first normally open switching means, when ever the voltage level of said normal direct current source exceeds a predetermined level;

said first switching means, connected across said resistor-capacitor network, for shorting said network when actuated by said first voltage sensing means; and

a second voltage sensing means, connected to sense the voltage across said resistor-capacitor network, and coupled to said trip switch, for generating said triggering signal for said trip switch whenever the voltage level of said resistor-capacitor network exceeds a predetermined level.

4,352,139
FLEXIBLE CONNECTOR FOR H.V. ARRESTER

John P. Du Pont; Hatim H. Taj, both of Waukesha; Randall R. Schoenwetter, Milwaukee; Theodore J. Vanlankvelt, Elm Grove; Robert E. Kwiatkowski, Eagle, and Richard W. Lange, Waukesha, all of Wis., assignors to RTE Corporation, Waukesha, Wis.

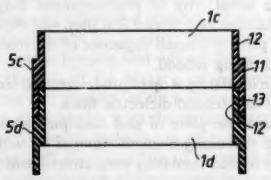
Filed Feb. 4, 1980, Ser. No. 118,580
Int. Cl.³ H02H *9/04*
U.S. Cl. 361—117 **12 Claims**

1. A gaples arrester comprising a dielectric elastomeric housing having a bore in one portion and a receptacle in another portion thereof, an arrester block assembly positioned in said bore, said assembly being formed from one or more surge arrester blocks, a connector at one end of the surge arrester blocks, and an electrically conductive flexible wire connecting said connector to said surge arrester blocks, whereby said connector will be located at the inner end of said receptacle when said assembly is positioned in said bore.

4,352,140
SURGE ARRESTER

Bror Axelsson, Västervik; Ulf Johnsen, Ludvika; Lennart Stenström, and Bengt Thors, both of Ludvika, all of Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

Filed Apr. 24, 1981, Ser. No. 257,262
Claims priority, application Sweden, May 5, 1980, 8003329
Int. Cl.³ H02H *3/22*
U.S. Cl. 361—127 **8 Claims**



1. A surge arrester comprising:

an insulating housing;

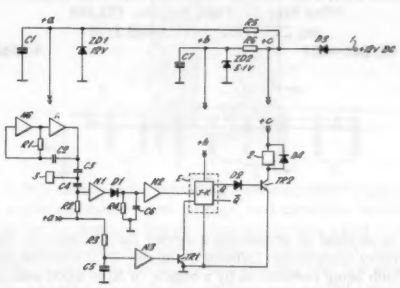
a plurality of cylindrical varistor blocks arranged coaxially in a stack in said housing, the end surfaces of said varistor blocks being provided with electrodes for electrical series connection of said blocks in said stack; and

annular protective members of insulating material tightly surrounding the envelope surfaces of said varistor blocks, said protective members being formed so as to overlap each other between varistor blocks positioned adjacent to each other.

4,352,141
TOUCH SWITCH DEVICE

Brian Kent, Hemel Hempstead, England, assignor to Starcote Limited, Hertfordshire, England

Filed Dec. 8, 1980, Ser. No. 214,048
Int. Cl.³ H01H *36/00*
U.S. Cl. 361—181 **2 Claims**



1. A touch switch device comprising an oscillator; a charging circuit, including a capacitative store, for receiving a signal from said oscillator; means, including a touch plate, responsive to close approach to said plate to interrupt the passage of the signal from said oscillator to said charging circuit, the store being arranged to discharge when the said passage is interrupted; a switch; a bistable circuit controlling the state of the switch; means responsive to a change in the charge state of the store consequent on the said interruption to cause said bistable circuit to change the state of the switch, the switch remaining in the state to which it is changed when the said interruption ceases; means responsive to the supply of electrical power to the device to cause the said bistable circuit to maintain the state of the switch in a predetermined state for an initial period, during which the said switch is maintained unresponsive to interruptions of the said signal; said means responsive to said supply being operative during said initial period to feed a reset signal to said bistable circuit, said bistable circuit being responsive to the reset signal to maintain said switch in said predetermined state; said means responsive to the change in the charge state of the store causing the bistable circuit to control the state of the switch, after the elapse of said initial period, in accord with the changes in the charge state of said capacitative store.

4,352,142
COMPOSITE AIRCRAFT STRUCTURE HAVING LIGHTNING PROTECTION

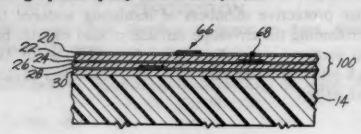
Glenn O. Olson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 15, 1981, Ser. No. 254,799
Int. Cl.³ H05F *3/00*
U.S. Cl. 361—218 **4 Claims**

1. An aircraft structure comprising in combination:

a graphite epoxy laminate layer;

a sandwich structure applied to one major surface area of said graphite epoxy laminate layer;



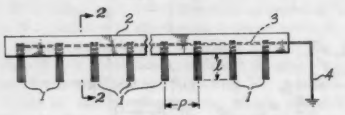
said sandwich structure comprising a pair of layers of aluminum foil having a layer of dielectric material disposed between said pair of layers of aluminum foil.

4,352,143

DEVICE FOR DISCHARGING STATIC ELECTRICITY AND METHOD OF PRODUCING THE SAME

Kenkichi Uno, 1407 80th St. SW., Everett, Wash. 98203

Filed May 27, 1980, Ser. No. 153,269
Int. Cl.³ H05F *3/00*; A46B *3/06*
U.S. Cl. 361—221 **6 Claims**



1. A method of producing a device for discharging static electricity comprising: forming a plurality of electrodes, each of which being constituted by a bundle of 50 to 1,000 pieces of stainless steel fibers each having a diameter of 5 to 50μ, said bundle being twisted such that the number n of twist falling within the range of $0.1 \leqq n \leqq 3$; fixing said electrodes at their base ends to a supporting frame at a right angle to the latter, such that the pitch of said electrodes is within 50 mm and the effective length of each electrode is not smaller than 3 mm; and releasing said bundles from twisting to obtain a larger width of each electrode at the free end of the latter than at the fixed base end of the same.

4. A method of producing a plurality of devices for discharging static electricity, comprising:

arraying a plurality of warps in a parallel relation, each of said warps consisting of a bundle of 50 to 1,000 pieces of stainless steel fibers each having a diameter of 5 to 50μ;

weaving a plurality of groups of conductive yarn into said warps at a right angle to the latter, such that distance between adjacent groups of wefts is not smaller than 3 mm;

fixing said wefts and warps at the points of contact therebetween;

and cutting said warps at portions in the close proximity of one side edge of each group of weft such that the cut warps have an equal length.

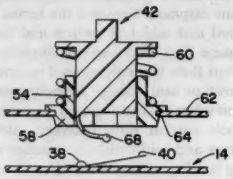
4,352,144

CAPACITIVE KEYSWITCH WITH OVERTRAVEL PLUNGER MECHANISM

John K. McVey, Bensenville, and Edward W. Wanatowicz, Jr., Elk Grove Village, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 21, 1981, Ser. No. 226,583
Int. Cl.³ H01G *5/16*
U.S. Cl. 361—288 **4 Claims**

1. A capacitive keyswitch comprising a fixed, flat capacitor plate in a first plane, a moveable flat capacitor plate hinged at one end to project in a second plane and to move towards a parallel position with respect to said fixed plate when an actuating force is applied to said moveable plate, an actuating plunger for applying said force to said moveable plate, return means for returning said plunger to its unactuated position and a flexible, cantilever mounted, overtravel arm integrally formed on said plunger which carries contact means that engages said moveable plate after said plunger has been depressed by a predetermined amount.

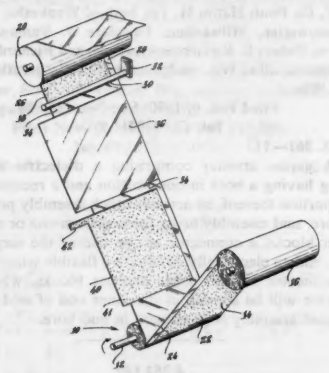


4,352,145

MULTIPLE ELEMENT CYLINDRICAL METALLIZED FILM CAPACITORS AND METHOD OF MAKING THE SAME

Robert M. Stockman, Brookfield Center, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

Filed Nov. 5, 1980, Ser. No. 204,164
Int. Cl.³ H01G *4/38*
U.S. Cl. 361—329 **8 Claims**



1. The method of making multiple element, cylindrical, metallized film capacitors from first and second dielectric films which are metallized on one side thereof and which are wound in cylindrical form with the non-metallized side of one film being in contact with the metallized side of the other film comprising the steps of:

providing a non-metallized area on a portion of the metallized side of said first dielectric film,

inserting a metal strip of predetermined length over the non-metallized area of said first film, said metal strip forming one plate of a small capacitor of the multiple element capacitor being wound,

inserting an insulating strip of predetermined length between said first and second dielectric films,

isolating said one plate of said multiple element capacitor from the remaining elements thereof by winding at least one turn of said insulating strip around said metal strip,

completing the winding of said first and second films, and

connecting a leadwire to said metal strip which constitutes a connection to the small capacitor formed by said metal strip in said multiple element capacitor.

5. In a multiple element, cylindrical capacitor wound from first and second dielectric films selectively metallized on one side and having at least one unmetallized section on one of said

films selectively forming first and second layers of metal separated by dielectric film, the invention comprising:

a metal insert having a metal tab extending therefrom,

said metal insert interleaved between said first and second dielectric films in contact with said unmetallized section of one of said films,

said metal tab extending from an end portion of said capacitor and adapted to receive an electrical connection thereto,

an insulating insert interleaved between said first and second films between said metal insert on one of said metallized layers surrounding said metal insert to isolate said metal insert from said metallized layer whereby said metal insert forms a separate plate in said multiple element capacitor.

4,352,146

RACK STRUCTURE FOR ELECTRICAL COMMUNICATIONS EQUIPMENT

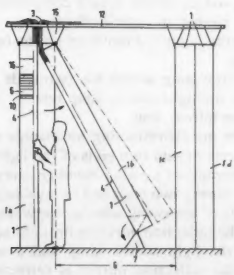
Peter Hermanutz, Ditzingen, and Franz Roessler, Hemmingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 99,147, Nov. 30, 1979, abandoned. This application Jul. 9, 1981, Ser. No. 281,819

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852823

Int. Cl.³ H02B *1/20*; H05K *7/16*

U.S. Cl. 361—428 **4 Claims**



1. A rack structure for supporting a plurality of wiring boards each capable of receiving one or more modular plug-in circuit boards, said structure including a subrack which in its normal position extends substantially vertically from its upper end to a lower end adjacent a support floor, a cable runway extending substantially horizontally above the upper end of said subrack, means hinging said subrack for unitary tilt movement about the axis of the hinging means from said normal position to one of a plurality of tilt positions with said subrack at respective acute angles from the normal position in the tilt positions, said subrack including a pair of spaced sidewalls with a cabling wall along one face of the spaced sidewalls for supporting wiring boards, the opposed face of the subrack being open for the insertion of said circuit boards for mating contact with respective wiring boards, a support member hinged to the subrack adjacent the lower end thereof, said support member hingedly movable to a support position resting on the support floor to maintain said subtrack in a tilt position enabling access to the cabling wall of the subrack.

4,352,147

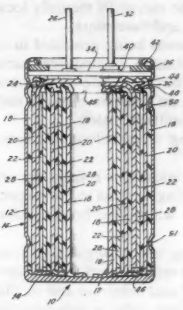
CAPACITOR FOR HIGH VIBRATION ENVIRONMENTS HAVING A CONTROLLED GAS RESERVOIR

William H. Elias, Six Mile, and Harold M. Granger, Greenville, both of S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.

Continuation of Ser. No. 974,163, Dec. 28, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 232,099

Int. Cl.³ H01G *9/00*; B01J *17/00*

U.S. Cl. 361—433 **19 Claims**



1. In a capacitor for providing a predetermined capacitance at a predetermined rated voltage, said capacitor including a case having disposed therein a first spacer film, a first electrode film abutting said first spacer film, a second spacer film containing a capacitor electrolyte and abutting said first electrode film, a second electrode film abutting said second spacer film, a first tab having a first terminal connected thereto abutting said first electrode film, and a second tab having a second terminal connected thereto abutting said second electrode film, the improvement comprising: said first spacer film disposed in said case with a predetermined fit leaving a minimum of clearance between said first spacer film and said case and said films having provided therein a predetermined gas volume in cubic inches less than a predetermined constant of two and greater than a predetermined constant of one times said predetermined capacitance in farads times said predetermined rated voltage in volts whereby relative motion between said films and said case is prevented while internal pressure rise of gas in said capacitor during operation is controlled.

4,352,148

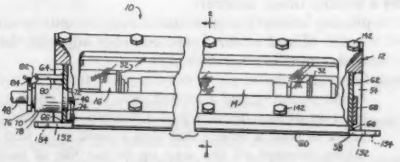
EQUIPMENT CORNER NOTCH-MOUNTED TRIANGULAR ENCLOSURE FOR TUBULAR LIGHT SOURCE

Howard P. McJunkin, Jr., Charleston, and Larry W. Rowley, Sissonville, both of W. Va., assignors to McJunkin Corporation, Charleston, W. Va.

Division of Ser. No. 927,735, Jul. 24, 1978, Pat. No. 4,282,564. This application Aug. 19, 1980, Ser. No. 179,439

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—61 **3 Claims**



1. An electric lighting system, comprising:

a substrate having two walls which meet at an approxi-

mately right angle at an outside corner having an outer edge;

said corner, along at least a portion of the length thereof being obliquely relieved to provide a notch in said outer edge;

a triangular enclosure for a tubular light source, comprising:

a unitary housing of generally isosceles right triangular transverse cross-sectional shape, thus having two sides which meet along a common border at generally a 90° angle, and each of which has a respective outer border where it is joined to the respective outer edge of a base plate; said housing further including two opposed generally triangular end walls securely located at opposite ends of said sides and base plate;

gland fitting means being provided in one of said end walls for communicating an electrical cable through the housing to and from the inside of the housing;

means defining an aperture through each said side;

two light transmitting lenses;

means mounting a respective said lens covering each said aperture;

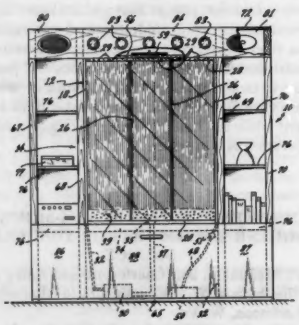
said mounting means in respect to one of said apertures removably mounting the lens to the respective side, in order to permit access to within the housing through the respective aperture;

means mounting said triangular enclosure in said notch so that said two sides thereof are substantially flush with said two walls of said substrate and so that said common border of said two sides is substantially aligned with said outer edge of said outside corner of said two walls.

4,352,149
SIMULATED RAIN ON A WINDOW PANE PANEL ASSEMBLY

Harold O. Stetler, 13066 Avenida Del General, San Diego, Calif. 92129

Filed Nov. 23, 1979, Ser. No. 96,768
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—96 **9 Claims**



1. A simulated rain on a window pane panel assembly for decorative use inside a building comprising a minor frame assembly having a pair of laterally spaced upright side frame members interconnected adjacent their respective bottom ends by a bottom frame member;

a primary tubular member extending substantially across the width of said minor frame assembly adjacent the top of said minor frame assembly;

a first rigid plastic panel covering the front of said minor frame assembly and a second rigid plastic panel covering the rear of said minor frame assembly, said plastic panels being of such a height that they extend from said bottom frame member all the way up to the top of said minor frame to form a water tight chamber therein, all the way up to said primary tubular member;

said primary tubular member also being positioned between said laterally spaced first and second plastic panels, said primary tubular member having a plurality of apertures across its length in its bottom surface, some of the apertures in the bottom of said primary tubular member being oriented to spray water droplets against the inner surfaces of said first and second plastic panel members;

a water pump;

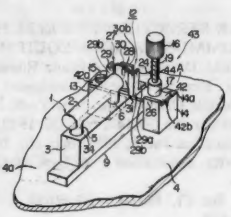
a water evacuation port formed adjacent the bottom of said water tight chamber; and

a first tubing member connected between one end of said primary tubular member and said water pump and a second tubing member connected between said water evacuation port and said water pump.

4,352,150
LIGHT SOURCE DEVICE

Seiichi Hosoda, Fuchu, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,478
Claims priority, application Japan, Sep. 17, 1979, 54-128386[U]
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—282 **12 Claims**



1. A light source device which comprises:

a housing having an outer surface;

a light source lamp rest mounted on the outer surface of the housing;

a light source lamp which has two ends and is detachably fitted to the light source lamp rest;

a reflection mirror; and

a reflection mirror-retracting mechanism which is set adjacent to one of said two ends of the light source lamp and which comprises a swing member carrying the reflection mirror, having two ends and swingable around one of said two ends of the swing member between a first position in which the reflection mirror is brought adjacent to said one end of the light source lamp and a second position in which the reflection mirror is retracted from the light source lamp, and fixing means for locking the swing member in the first position.

4,352,151
LIGHTING APPARATUS

Andrew G. Lewis, 1090 Webster La., Des Plaines, Ill. 60016

Continuation of Ser. No. 900,823, Apr. 28, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,668
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—368 **5 Claims**

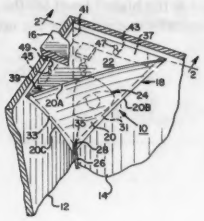
1. A corner mountable lighting apparatus adapted to be mounted in a corner space defined by a pair of intersecting vertical surfaces and by a horizontal surface, comprising:

open frame means adapted to be mounted to at least one of said surfaces;

light emitting means mounted on said frame means;

said frame means having a substantially triangularly shaped inclined front panel disposed in front of said light emitting means and at least partly composed of translucent material to permit light to pass therethrough from said light emitting

means, said frame means including mounting means having at least one generally triangularly-shaped member connected fixedly along one of its edges to an adjoining edge of said front panel with the planes of said panel and said member being disposed at an acute angle to enable said apparatus to fit into the corner space and to position said front panel at an incline relative to said member to effectively close off said corner space, said member being adapted to overlie one of said surfaces, said mounting means having means defining at least one fastening member receiving opening therein to



facilitate the mounting of said apparatus to at least one of said surfaces, said mounting member being a generally triangularly shaped side flange adapted to engage in overlying relationship one of said vertical surfaces, an oppositely disposed second generally triangularly shaped side flange being adapted to engage in overlying relationship the other one of said vertical surfaces, said fastening member receiving opening including a C-shaped rearwardly-facing open slot, means defining a second fastening member receiving opening, said second opening including a C-shaped rearwardly-facing open slot.

4,352,152

HIGH SPEED NON-SATURATING INVERTER

Stephen H. Smith, Playa del Rey, Calif., assignor to Hybricon Inc., North Hollywood, Calif.

Filed Jan. 11, 1980, Ser. No. 111,259
Int. Cl.³ H02M *1/12*
U.S. Cl. 363—41 **17 Claims**

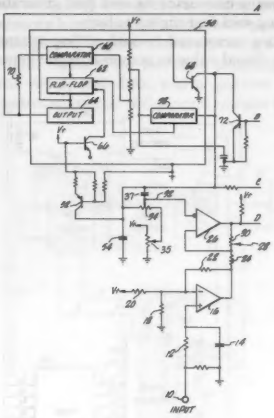
1. Apparatus for generating a variable duty cycle pulse train comprising

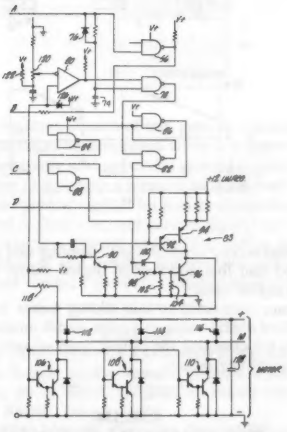
means adapted to receive a control signal,

sawtooth generator means for supplying a sawtooth waveform,

first amplifier means responsive to said control signal for establishing a reference voltage in accordance with the amplitude of said control signal, and

open loop amplifier means responsive to said reference voltage and said sawtooth generator means for generating a train of pulses, the value of said reference voltage establishing the duty cycle of said pulse train, said open loop amplifier means including means for providing positive





feedback of a substantially smaller amplitude than the amplitude of the output of said open loop amplifier means.

4,352,153

REGULATED CONVERTER WITH VOLT-BALANCING CONTROL CIRCUIT

Joseph L. Voyer, Longwood, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 11, 1981, Ser. No. 242,519
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—56 **15 Claims**

1. In a power supply comprising an input circuit, an output circuit, first and second switching means driving opposite sides of the input windings of an output transformer when enabled, means for generating pulse-width modulated control signals for enabling said switching means comprising:

first means for generating a first digital value representing the change in level of the output circuit;

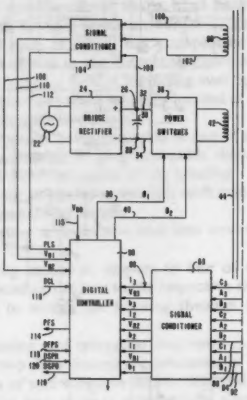
means for sensing the output level of said first and second switching means;

second means for generating first and second control signals

upon the output level of said first and second switching means reaching a first threshold level;

adding means connected to said first generating means for receiving said first digital values;

logic means connected to said adding means to output a second digital value in response to the generation of said



first and second control signal enabling said adding means to add said first and second digital values to produce a third digital value;

and means connected to said adding means for converting the third digital value to a pulse-width modulated control signal for changing the output level of said first and second switching means.

4,352,154

VARYING TWO PHASE VOLTAGES IN DC TO THREE PHASE CONVERTER

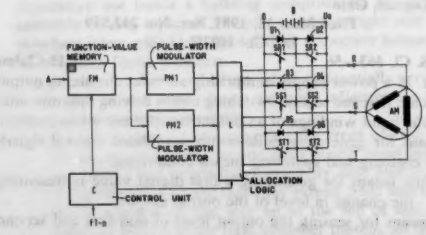
Hans Reiber, Stuttgart, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,335

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007629

Int. Cl.³ H02M 7/44

U.S. Cl. 363—123 **12 Claims**



1. A method of controlling the generation of three-phase alternating current flowing, with a one-third period shift between the phases, between two terminals of a DC source which are at different voltage levels, comprising, during each one-sixth of the period, the steps of:

maintaining a respective one of the three phases at a respective one of the voltage levels; and

varying the voltages of the respective remaining two phases in substantially sinusoidal waveforms with a shift of 60 electrical degrees therebetween,

such that, in the course of the respective period, the voltage of the respective phase remains at the lower level for one-sixth, then sinusoidally rises for the next two-sixths, then remains at the higher level for the next one-sixth, and finally sinusoidally decreases for the next two-sixths of the period.

4,352,155

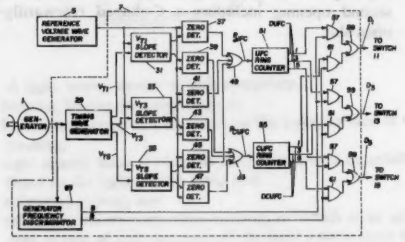
VARIABLE SPEED CONSTANT FREQUENCY POWER CONVERTER WITH TWO MODES OF OPERATION

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1981, Ser. No. 292,975

Int. Cl.³ H02M 5/275

U.S. Cl. 363—163 **14 Claims**



9. A frequency changer for synthesizing an output line, an output waveform of a desired substantially constant frequency from segments of a multiphase input waveform of varying frequency comprising,

a bidirectional switch connected between each phase of the input waveform and the output line;

means for determining the frequency of the multiphase input waveform;

means for generating timing waveforms phase locked to each phase of the input waveform;

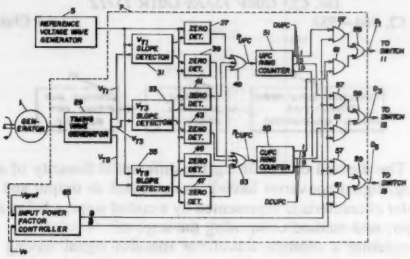
means for generating a reference waveform at a frequency equal to the fundamental frequency of the desired output waveform;

control means responsive to said timing waveform generating means, said frequency determining means and said reference waveform generating means for sequentially turning on said bidirectional switches, while the frequency of said input waveform is equal to or less than a preselected frequency, at instants when the reference waveform is equal in amplitude to a timing waveform but opposite in slope and for sequentially turning on said switches, while the frequency of said input waveform is greater than the preselected frequency, at instants when the reference waveform is equal in amplitude and has a slope of the same sense as a timing waveform.

4,352,156
AC TO AC POWER CONVERTER WITH A CONTROLLABLE POWER FACTOR

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1981, Ser. No. 293,045
Int. Cl.³ H02M 5/22
U.S. Cl. 363—163 **14 Claims**



9. A frequency changer for generating on an output line an output waveform of one frequency, from a multiphase input waveform of another frequency, and for controlling the power factor of the input waveform, said frequency changer comprising:

a bidirectional switch connected between each phase of a multiphase input waveform and the output line,

a timing wave generator for generating a set of timing waveforms phase locked to each phase of the input waveform,

a reference waveform generator for generating a reference waveform having a frequency equal to that of the fundamental component of the output waveform,

first switching control means which when enabled turn on the bidirectional switches sequentially one at a time at instants when the reference waveform is equal in amplitude but opposite in slope to one of the timing waveforms such that the power factor of the input waveform is opposite to that of the output waveform generated thereby;

second switching control means which when enabled turn on the bidirectional switches sequentially one at a time at instants when the reference waveform is equal in amplitude to, and has a slope of the same sense as, each of the timing waveforms, such that the power factor of the input waveform is the same as that of the output waveform generated thereby;

means for repetitively generating timing intervals having a frequency which is higher than the frequency of the input waveform; and

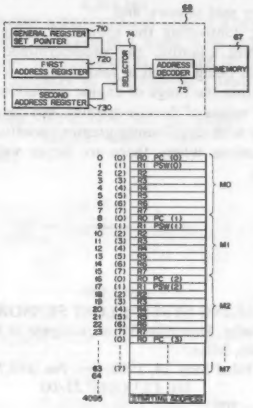
means for enabling one switching control means and then the other during each interval, with the relative proportion of each interval in which each switching control is enabled being selected to provide the selected input power factor.

4,352,157
DATA-PROCESSING APPARATUS HAVING IMPROVED INTERRUPT HANDLING PROCESSOR

Keiji Namimoto, Yokohama; Seiji Eguchi, Kawasaki, and Yutaka Murao, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 907,856, May 19, 1978, Pat. No. 4,217,638. This application Feb. 4, 1980, Ser. No. 118,316
Claims priority, application Japan, May 19, 1977, 52-57100; May 19, 1977, 52-57101; May 19, 1977, 52-57102
The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.
Int. Cl.³ G06F 9/18, 13/00
U.S. Cl. 364—200 **4 Claims**

1. A data processing apparatus comprising a central processing unit formed in a single IC chip for comparing data, arithmetically processing data and branching data, said central processing unit including a memory including a plurality of addressable memory locations, and at least two general register sets, each of said general register sets comprising a plurality of associated general registers for storing a program counter, a program status word, and data, and a general register set pointer for designating any of said general register sets, each of

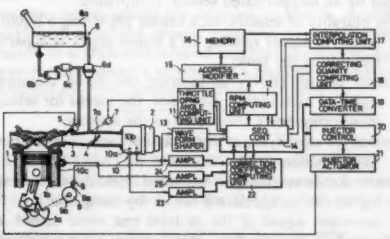


said general registers of each of said general register sets having a first address to be designated when said general register set pointer designates said associated general register set and a second address to designate a memory location used as a work area when said general register set pointer designates the other of said general register sets, said general register sets including at least one common general register for storing data associated with either of said general register sets, and means for addressing said common general register to store data therein.

4,352,158
ENGINE FUEL SUPPLY CONTROLLING SYSTEM

Tasuku Date, Tokyo; Toshio Nomura, Niiza, and Isao Kobayashi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,811
Claims priority, application Japan, Apr. 2, 1979, 54-38394
Int. Cl.³ F02M 51/00; F02D 5/02
U.S. Cl. 364—431.05 **6 Claims**



1. An engine controlling system comprising:

a plurality of sensors for detecting the engine operating conditions,

a memory storing the digital values of predetermined fuel injection quantities depending upon two parameters which are derived from the outputs of two of said sensors

and represent throttle valve position and engine rpm at storage locations that are addressed by said two parameters,

means responsive to said parameters for addressing said memory to read out of said memory the digital fuel injection quantity based on said two parameters,

means for obtaining corrected fuel injection quantity from said read-out fuel injection quantity multiplied by a coefficient associated with at least one further parameter detected by said sensors, and

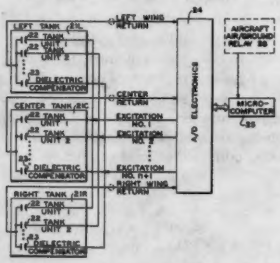
means for controlling the engine by using the corrected controlling quantity, the predetermined fuel injection quantities being stored in said memory with small variations within the range of engine operation corresponding to small values of throttle opening, but being stored in said memory with significantly greater variations in that range of operations where there are larger values of throttle opening.

4,352,159

LIQUID GAGING SYSTEM LOST SENSOR RECOVERY

Dwight D. Colby, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 14, 1980, Ser. No. 149,773
Int. Cl.[3] G01F *23/00*
U.S. Cl. 364—509 **11 Claims**



1. In a liquid gaging system wherein a value related to a liquid quantity in a tank is determined by the system based on signals from a plurality of sensors, the accuracy of the value being dependent upon the validity of the signals from the sensors, an apparatus for reducing error in the value introduced by an incapacitated sensor, comprising:

the plurality of sensors, each sensor providing a liquid measurement signal relating to a liquid depth at a particular location in the tank;

means for selectively monitoring the liquid measurement signal of each individual sensor, the means for selectively monitoring being connected to the sensors;

means for identifying at least one sister sensor corresponding to each sensor; and

means for determining an estimated liquid depth corresponding to the incapacitated sensor by using the liquid measurement signal of the at least one sister sensor corresponding to the incapacitated sensor and for determining the value based on the liquid measurement signals and the estimated liquid depth, the means for determining being connected to the means for selectively monitoring and the means for identifying;

whereby the value has less error associated with it than if an invalid liquid measurement signal from the incapacitated sensor were used to determine the value.

4,352,160

STATISTICAL METHOD OF MEASURING THE DIFFERENTIAL LINEARITY OF AN ANALOG/DIGITAL CONVERTER USING A PSEUDO-RANDOM TRIANGLE WAVE STIMULUS

John W. Frech, Baltimore, Md., and Lonnie C. Au, Fort Wayne, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 21, 1980, Ser. No. 113,890
Int. Cl.[3] G06F *15/20*; G01R *15/12*
U.S. Cl. 364—553 **1 Claim**

1. The method of measuring the differential linearity of an analog/digital converter having an input and an output and a transfer characteristic represented by n coded steps, n being an integer, said method comprising the steps of

generating a triangle waveform stimulus signal having a uniform amplitude probability density function and a pseudo random periodicity, the frequency of said triangle waveform stimulus signal having a relationship to the analog/digital sampling rate that permits equal sampling at all points along the analog/digital converter, said frequency being not less than 5 Hz nor more than 20 MHz, the repeat period of said pseudo random stimulus signal being substantially longer than the test period of said analog/digital converter, the amplitude of said triangle waveform stimulus signal being less than the analog/digital input signal voltage range, and the analog/digital converter D.C. being shifted to measure the linearity of a given portion of the analog/digital converter transfer characteristics,

applying said signal to the input of said analog/digital converter,

counting the number of times the output code word for each transfer characteristic step occurs, each step size being a function of the number of times its code word occurs,

recording a list of all transfer characteristic step sizes,

recording transfer characteristic step sizes that fall within discrete analog/digital converter step size windows, and

recording D.C. locations for all values within any analog/-digital step size window.

4,352,161

ELECTRONIC CALCULATOR CAPABLE OF DEALING WITH VARIABLES

Reiji Hirano, Yokohama, and Shinichi Nakata, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 34,207, Apr. 27, 1979, abandoned, which is a continuation of Ser. No. 841,293, Oct. 12, 1977, abandoned. This application Feb. 12, 1981, Ser. No. 233,883
Claims priority, application Japan, Oct. 25, 1976, 51-128057
Int. Cl.[3] G06F *15/06*
U.S. Cl. 364—706 **5 Claims**

1. An electronic calculator comprising:

keyboard means having numeric keys for entering numerical informtion and instruction keys for entering instruction information;

program memory means connected to said keyboard means for storing instruction information;

second memory means connected to said keyboard means for storing a value in the form of numerical information;

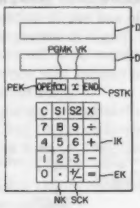
first display means connected to said second memory means for displaying said value;

first processing means connected to said second memory means and said program memory means for processing said value in accordance with the instruction information stored in said program memory means to obtain a result;

third memory means connected to said first processing means for storing said result;

second display means connected to said third memory means for displaying said result; and

second processing means connected to said second memory means, said third memory means and said keyboard means



for selectably processing either said result or said value in accordance with instruction information entered by way of said keyboard to obtain either a modified result or a modified value and for storing said modified result or said modified value, as the case may be, in said second memory means.

4,352,162

DIGITAL FILTER

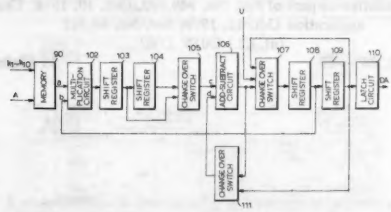
Tomoaki Nyuji, Hirakata; Itaru Kawasaki, Minoo; Masahiro Noguchi, Hirakata, and Masahide Tsukamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1980, Ser. No. 162,614

Claims priority, application Japan, Jun. 25, 1979, 54-80603; Jan. 18, 1980, 55-4855

Int. Cl.³ G06F *15/34;* G10L *1/00*

U.S. Cl. 364—724 **6 Claims**



1. A digital filter for responding to digital exciting signals and a plurality of digital values representing filter coefficients, comprising a memory means for storing a plurality of digital values representing filter coefficients, a multiplication circuit having a first input which is connected to an output from said memory means, a first delay circuit means which is connected to an output from said multiplication circuit, a first intermittently operating delay circuit means which is connected to an output from said first delay circuit means, a first change-over switch means for selectively changing over from either said output from said first delay circuit means or an output from said first intermittently operating delay circuit means, an addition-subtraction circuit having a first input which is connected to an output from said firsrt change-over switch means, a second delay circuit means which has an output which is connected to a second input of said multiplication circuit, a second intermittently operating delay circuit means which is connected to an output from said second delay circuit means, a second change-over switch means for selectively changing over from either an output of said addition-subtraction circuit or an output of said second intermittently operating delay circuit means and for outputting same as a second input for said addition-subtraction circuit, a third change-over switch for selectively changing over from either an output from said addition-subtraction circuit or an output from said second intermittently operating delay circuit means and for outputting same as an input for said second delay circuit means, and a latch means for temporarily storing a data output from said second intermittently operating delay circuit means.

4,352,163

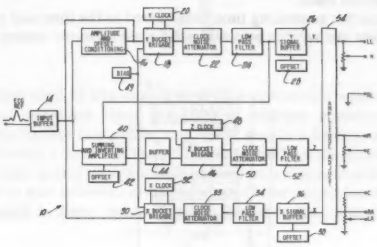
VECTORCARDIOGRAM SIMULATOR

Edward R. Schultz, Jr.; Kenneth J. Cook, both of Troy; Joseph S. Power, Fraser, and Frederick B. Ruszala, Sterling Heights, all of Mich., assignors to The Valeron Corporation, Troy, Mich.

Filed Nov. 9, 1979, Ser. No. 93,085

Int. Cl.³ G06G *7/48*

U.S. Cl. 364—801 **22 Claims**



1. An electronic waveform simulator for generating simulated waveforms for testing the operability of a vectorcardiogram machine, said device comprising:

reference means for providing a reference simulated electrocardiogram waveform;

X waveform generator means for generating a waveform simulating an X-axis vectorcardiogram waveform, said X waveform generator means including a first electronic bucket brigade having an input coupled for receipt of said reference waveform, operative to delay the generation of said reference waveform at an output of the first electronic bucket brigade for a first given time period;

Y waveform generator means for generating a waveform generally simulating a Y-axis vectorcardiogram waveform and having an input coupled for receipt of said reference waveform;

Z waveform generator means for generating a waveform generally simulating a Z-axis vectorcardiogram waveform and having an input coupled for receipt of said reference waveform; and

connector means selectively coupled to the X, Y and Z waveform generator means, operative to supply output signals to a vectorcardiogram machine corresponding to waveforms ordinarily supplied by a plurality of electrodes attached to a live patient at various positions.

4,352,164

DATA RECORDING METHOD AND APPARATUS

Alan C. Reed, Salt Lake City, and John H. Sherwood, Bountiful, both of Utah, assignors to Utility Devices, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 872,648, Jan. 26, 1978, which is a continuation of Ser. No. 755,846, Dec. 30, 1976, abandoned, which is a continuation of Ser. No. 592,057, Jun. 30, 1975, abandoned. This application Sep. 24, 1979, Ser. No. 78,439

The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **16 Claims**

1. A portable electronic recording apparatus for recording

the data displayed on each of a plurality of designated utility meters, wherein said meters are positioned at a plurality of different locations and each of said meters has a unique identification number, the recording apparatus comprising:

a solid state memory means for storing meter location, meter identification and meter data therein;

first means for writing into selected locations of said memory, in sequence, the meter location information of each of a plurality of meters and the meter identification of each of said plurality of meters;

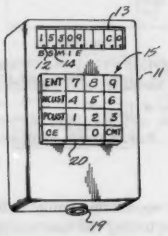
a temporary memory for temporarily storing said meter data as said meter data is keyed into said recording apparatus;

a keyboard means for introducing said meter data for each of said meters into said temporary memory;

comparator means for comparing said temporarily stored meter data with at least one preselected limit;

second means for writing said meter data into an address meter data storage location in said solid state memory means if said meter data is within at least one predetermined limit;

means for generating time data related to the time said meter data are written into said solid state memory means;



means for writing said time data into said solid state memory means;

selective means in said keyboard means for erasing the meter data in said temporary memory location if said meter data is outside said at least one preselected limit;

a display means for visually displaying in sequence for each meter, the meter location, the meter identification and the meter data keyed into said memory means;

means for addressing said memory means for coupling the information in the address memory location to said display means; and

means for advancing said addressing means after said meter location information is displayed to the memory location of at least one meter identification number corresponding to said location, said addressing means being responsive to said advancing means to address a meter data storage location after said meter identification number has been displayed, said addressing means being responsive to said advancing means for addressing the next meter location after said meter data has been stored in said addressed memory location.

4,352,165

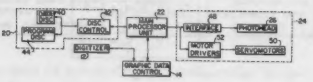
APPARATUS FOR STORING AND RETRIEVING DATA

Charles M. Hevenor, Jr., Bolton, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Dec. 17, 1979, Ser. No. 104,196
Int. Cl.³ G06F *13/04, 3/06*
U.S. Cl. 364—900 **9 Claims**

1. In a system for processing data defining a graphic workpiece and having a main processing unit controlling the processing of the data between a source and an output device for the data, an improved random access data storage and retrieval apparatus for storing and retrieving workpiece data comprising:

data memory means connected with the main processor unit for storing the data processed through said unit and including a data entry file in a storage medium having a plurality of physically distributed memory locations for storing data defining the workpiece, the memory locations in the file being divided geometrically into groups of contiguous locations, each group having a memory address corresponding to one of a plurality of defined geometric zones of the workpiece for entry of data from said defined zone and no other zone; and



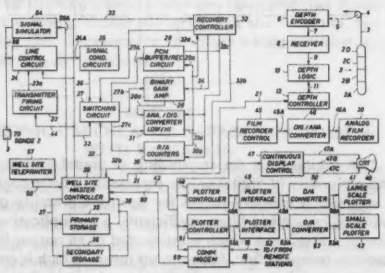
means for directly storing and retrieving data from the zones of the workpiece randomly in the corresponding groups of memory locations by means of has memory addresses, the data associated with a defined zone being stored in the entry file exclusively in the corresponding group of memory locations.

4,352,166

SYSTEM AND METHOD FOR VISUAL DISPLAY OF WELL-LOGGING DATA

Larry G. Schoonover, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 949,592, Oct. 10, 1978. This application Oct. 12, 1979, Ser. No. 84,401
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—69 **11 Claims**



1. A method of investigating the character of subsurface earth materials traversed by a borehole, comprising

deriving a plurality of well-logging measurements of said earth materials at selected locations along the length of said borehole,

deriving and storing recordable measurements of first and second selected lithological characteristics of said materials at said locations on a real-time basis as a function of at least one of said plurality of well-logging measurements, and

displaying and recording a visible representation of said first and second characteristics and said character of subsurface materials defined by a difference between said first and second characteristics, wherein said displaying step

further comprises retrieving said measurement of said first characteristic,

generating a first sequence of digital 0's having a first total number corresponding to said measurement of said first characteristic

storing a 2-dimensional lithological matrix pattern of digital 1's and 0's corresponding to said character of subsurface materials,

retrieving said measurement of said second characteristic,

retrieving at least a portion of one line of said matrix pattern,

generating a second sequence of digital 1's and 0's from said portion having a second total number corresponding to the difference between said measurement of said second and said first characteristics,

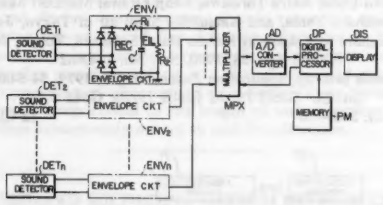
generating a third sequence of digital 0's having a third total number corresponding to the difference between a preselected total and the sum of said first and second total numbers, and

displaying in sequence a visible representation of said first, second and third sequences.

4,352,167
METHOD OF LOCATING SOUND GENERATION WITHIN ENCLOSURE

Yuuji Hashimoto, Hiroshima; Izumi Kobayashi, Higashikurume; Mitsuo Suzuki, Yokohama; Kimio Yamada, Hitachi; Shigeru Izumi, Tokyo, and Yoshihiro Michiguchi, Ibaraki, all of Japan, assignors to The Chubu Electric Power Co., Inc.; The Chugoku Electric Power Co., Inc.; The Tokyo Electric Power Co., Inc. and Hitachi, Ltd., all of Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,559
Claims priority, application Japan, Sep. 14, 1979, 54-118306
Int. Cl.³ G01S *5/18*
U.S. Cl. 367—127 **15 Claims**



1. A method of determining a location at which a sound signal is produced in an object to be monitored in respect of generation of said sound signal, comprising steps of providing a plurality of detectors at a corresponding number of portions of said object each for detecting propagation of sound, determining relative peak values and time differences among detection signals available from said detectors, and comparing combinations of said relative peak values and said time differences with combinations of relative peak values and the time differences which are previously measured for said object, to thereby determine the location at which the sound signal is produced.

4,352,168
DIVER'S BOTTOM TIMER/DEPTH GAUGE OR THE LIKE AND DIRECT DIGITAL INPUT AND TRACKING SYSTEM THEREFOR

Robert D. Anderson, 3936 Hendrix St., Irvine, Calif. 92714

Filed Apr. 14, 1980, Ser. No. 139,741
Int. Cl.³ G04B *47/00*; G01L *7/20*; G08C *9/00*
U.S. Cl. 368—10 **6 Claims**

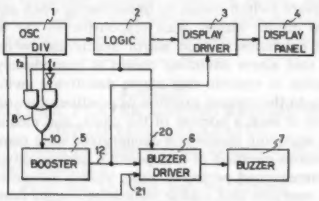
1. A direct digital input and tracking system for converting mechanical movement input into a predetermined digital input for a microprocessor or the like comprising: a plurality of movable contacts in a predetermined arrangement, said contacts being moved in response to a sensed condition such as variation in ambient pressure; and a patterned array of coded, binary input lines located beneath said contacts, one binary line for each said contact, said binary lines being connected to a microprocessor or computer in preplanned fashion, whereby the sensed condition is directly converted into binary signals

without need of any analog to digital conversion means, said sensed condition being variation in ambient pressure, said system further comprising a pressure sensitive bellows assembly having a fixed end and an opposite end linearly movable in response to said sensed condition, said movable contacts being fixed to said bellows movable end, said binary input lines being arranged in linear fashion beneath said movable contacts.

4,352,169
ELECTRONIC TIMEPIECE

Kazuhiro Asano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 11, 1978, Ser. No. 933,094
Claims priority, application Japan, Sep. 1, 1977, 52-105079
Int. Cl.³ G04B *23/02*; G04C *3/00*; G08B *3/00*
U.S. Cl. 368—73 **5 Claims**



1. An electronic timepiece, comprising: an oscillator circuit for generating a plurality of oscillatory output signals; means comprising a logic circuit for generating a buzzer control signal to control buzzer operation and for generating output signals representative of time; display means responsive to the output signals of said logic circuit for displaying time; a buzzer comprised of a piezoelectric element; a buzzer driving circuit for applying an oscillatory driving signal to drive said piezoelectric element; a voltage booster circuit comprising voltage boosting means for boosting a supply voltage applied to said voltage boosting means and for applying an oscillatory driving signal having an amplitude equal to the boosted voltage to said buzzer driving circuit, and said voltage boosting means having an output current capacity dependent upon the frequency of an oscillatory input signal applied thereto; signal selection means responsive to said buzzer control signal for selecting among different frequency oscillatory output signals generated by said oscillator circuit and for applying a selected signal of one frequency to said voltage booster circuit when said buzzer is to be inoperative and for applying another selected signal of a

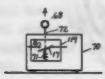
different frequency to said voltage booster circuit when said buzzer is to operate and which is effective to increase the output current capacity of said voltage booster circuit during buzzer operation.

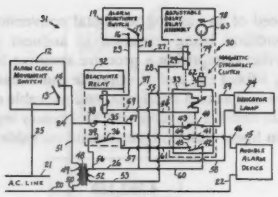
4,352,170

ALARM DEACTIVATION SYSTEM EMPLOYING TIMED MANUAL SWITCH OPERATION

Milton W. Jetter, 301 G St., SW., Washington, D.C. 20024

Filed Dec. 22, 1980, Ser. No. 218,519
Int. Cl.³ G04C *21/00*
U.S. Cl. 368—73 **7 Claims**





1. In an alarm clock system, alarm sounding means, movement-actuated switch means, alarm circuit means to normally energize the alarm sounding means responsive to operation of said movement-actuated switch means, normally-open alarm deactivate switch means in the clock, circuit means including the deactivate switch means to immediately open and to hold said alarm circuit means open responsive to the initial and continued operation of said alarm deactivate switch means, whereby said alarm sounding means is immediately deenergized, means to operate said alarm deactivate switch means responsive to the manual exertion of positive upward force by the user on at least a portion of the clock, and means to latch the alarm sounding means in a deenergized state responsive to the continuous exertion of said positive manual upward force for a predetermined period of time, visible indicating means, means to energize said visible indicating means continuously during said predetermined period of time, and means to deenergize said indicating means and remove its indication at the termination of said period to inform the user that said positive upward force can be discontinued.

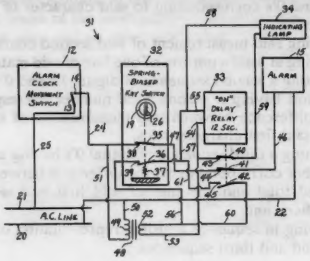
4,352,171

CLOCK ALARM-DEACTIVATING SYSTEM

Milton W. Jetter, 800 4th St., SW., Washington, D.C. 20024

Filed Jun. 26, 1980, Ser. No. 163,397
Int. Cl.³ G04C *21/00*
U.S. Cl. 368—73 **5 Claims**

1. In an alarm clock system, clock movement-actuated alarm-activating means, alarm sounding means, and circuit means to energize the alarm sounding means responsive to operation of said movement-actuated means, said circuit means including normally-closed key-controlled turn-off switch means having a removable key, said key being manually insertable at times in the turn-off switch means for operating said turn-off switch means to open condition, means to latch the key-controlled switch means in open condition, means to provide a predetermined time delay period during which the key must be held by the user after insertion to keep the switch means open between the initial operation of said key-controlled switch means and said latched-open condition, said alarm sounding means being deenergized immediately responsive to the manual operation of said key-controlled turn-off switch means and being maintained deenergized while the



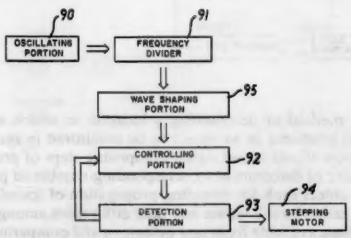
turn-off switch means is manually continuously held open during said time delay period, visual indicating means, and circuit means to provide display by said visual indicating means during said time delay period and to turn off said indicating means at the end of said time delay period.

4,352,172

DETECTION DEVICE OF ELECTRONIC TIMEPIECE

Makoto Ueda; Akira Torisawa; Shuji Otawa; Masaaki Mandai; Masaharu Shida, and Katsuhiko Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,662
Claims priority, application Japan, May 4, 1979, 54-54862
Int. Cl.³ G05B *19/40*; G04B *19/00*; G04F *5/00*
U.S. Cl. 368—76 **12 Claims**

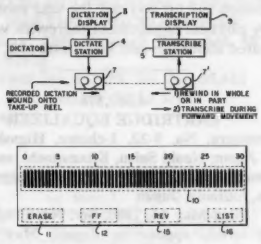


1. In an electronic timepiece having a stepping motor comprised of a stator, rotor and coil; means for generating and applying driving pulses to the coil to effect stepwise rotation of the rotor; magnetic field detecting means operable when enabled for detecting the presence of an external alternating magnetic field, said magnetic field detecting means comprising a first loop comprised of a first impedance element and said coil; rotation detecting means operable when enabled for detecting rotation and non-rotation of the rotor, said rotation detecting means comprising said first loop and a second loop comprised of a second impedance element and said coil; and circuit means for enabling said magnetic field detecting means by switching said coil from an open-circuit condition to said first loop and for enabling said rotation detecting means by alternately switching between said first and second loops.

4,352,173
DICTATION DISPLAY DEVICE

Theodore Titus, IV, Tucker, and Julius B. Bagley, Atlanta, both of Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Filed Apr. 9, 1979, Ser. No. 27,990
Int. Cl.³ G11B *27/34*
U.S. Cl. 369—27 **12 Claims**



7. In a system for transcribing dictation recorded on a recording medium as said recording medium was moved in a first direction relative to a transducer;

motion means for moving said recording medium in said first direction and in a second direction opposite to said first direction;

transcribing means for transcribing said dictation as said recording medium is moved in said first direction;

a display array;

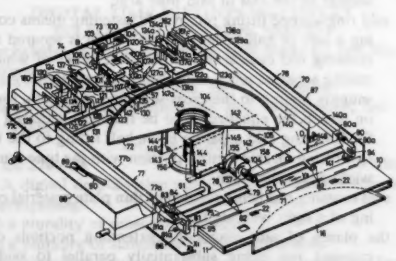
first display means for providing a first display moving from a particular end of said display array having a length proportional to the length of said recording medium moved in said second direction in response to said recording medium being moved in said second direction; and

second display means response to said recording medium being moved in said first direction subsequent to being moved in said second direction for providing a second display superimposed on said first display and moving from said particular end of said display array having a length proportional to the length of said recording medium subsequently moved in said first direction.

4,352,174
DISC-SHAPED RECORDING MEDIUM REPRODUCING APPARATUS

Osamu Tajima, Kanagawa; Takashi Yamamura, Yokohama; Masafumi Mochizuki, Yamato, and Yoichi Mita, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 5, 1981, Ser. No. 231,868
Claims priority, application Japan, Feb. 7, 1980, 55-14221
Int. Cl.³ G11B *3/00*; H04N *5/76*
U.S. Cl. 369—77 **8 Claims**



1. A reproducing apparatus for reproducing a disc-shaped recording medium which is accommodated within a case, said case comprising a jacket which has a space for accommodating said disc-shaped recording medium and an opening for allowing said disc-shaped recording medium to go in and out of said jacket, and a lid plate inserted through said opening of said jacket for closing said opening of said jacket, said lid plate having cutouts and ride-over parts,

said reproducing apparatus comprising:

an inserting opening through which said case is inserted;

a turntable for rotating said disc-shaped recording medium;

lid plate locking means and disc-shaped recording medium clamping means respectively provided at the innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable; and

jacket opening enlarging means provided in the vicinity of said inserting opening, capable of moving over said turntable between the position in the vicinity of said inserting opening and said innermost part of said reproducing apparatus,

said jacket opening enlarging means having an enlarging member for enlarging said opening of said jacket by entering inside said cutouts of said lid plate, upon insertion of said jacket into said reproducing apparatus through said inserting opening,

said lid plate locking means having a locking member for locking said lid plate by entering inside said cutouts of said lid plate, upon insertion of said lid plate into the innermost part of said reproducing apparatus together with said jacket,

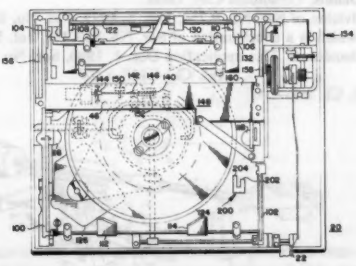
said disc-shaped recording medium clamping means having a clamping member for clamping said disc-shaped recording medium within said jacket by riding over said ride-over part of said lid plate and entering through the enlarged opening of said jacket, upon insertion of said lid plate into said innermost part of said reproducing apparatus together with said jacket, and

said jacket being pulled out in an empty state leaving behind said lid plate locked by said lid plate locking means and said disc-shaped recording medium clamped by said disc-shaped recording medium clamping means, when said jacket is pulled out from within said reproducing apparatus in a direction opposite to the direction of the insertion.

4,352,175
VIDEO DISC PLAYER HAVING RECORD SIDE IDENTIFYING APPARATUS

Horatio N. Crooks, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 19, 1981, Ser. No. 276,691
Int. Cl.³ G11B *17/04*
U.S. Cl. 369—77 **15 Claims**



1. In a player for use with a disc record enclosed in a protective caddy such that the respective sides of said record are associated with the corresponding sides of said caddy; said caddy being subject to insertion along a path into said player

through an input slot to load an enclosed record therein; a record side identifying apparatus comprising:

(A) a pair of independently-operated actuating members disposed in said player in said caddy insertion path; said actuating members being located such that they are operated respectively in a given and a reverse sequence depending upon which side of said caddy is uppermost during a caddy insertion; and

(B) means responsive to the sequence of operation of said actuating members for providing an indication of the record side subject to play.

4,352,176

ELECTROMAGNETIC PICKUP CARTRIDGE

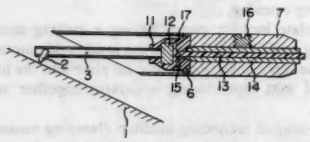
Masashi Itoh, Settsu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1980, Ser. No. 216,868

Claims priority, application Japan, Dec. 19, 1979, 54/165875; Feb. 6, 1980, 55/14601[U]

Int. Cl.³ H04R *11/12*

U.S. Cl. 369—170 **5 Claims**



1. An electromagnetic pickup cartridge having a vibration system wherein the vibration system comprises: a flat center-holeless armature symmetrical about its centerline and having opposite first and second major surfaces; a cantilever extended perpendicularly from the center of the first major surface of said flat armature provided with a stylus tip near the free end; an armature holder made of a high molecular weight resin molded to cover all the surfaces of the armature and the end of the cantilever adjacent the first major surface of the armature; a suspension thread, integral with the armature holder, extends perpendicularly to the center of the second major surface of said flat armature; a damper made of elastic material in contact with the armature holder, said armature holder being maintained in contact with the damper by means of the suspension thread extending through the damper and a sleeve.

4,352,177

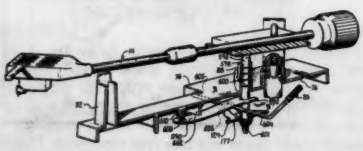
AUTOMATIC RECORD PLAYER

James T. Dennis, P.O. Box 15100, Oklahoma City, Okla. 73155, and George Kolomayets, Chicago, Ill., assignors to James T. Dennis, Oklahoma City, Okla.

Division of Ser. No. 9,254, Feb. 5, 1979, Pat. No. 4,291,886, which is a continuation of Ser. No. 813,225, Jul. 5, 1977, abandoned. This application Dec. 1, 1980, Ser. No. 211,859

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—246 **7 Claims**



1. A phonograph record player mechanism which includes a tone arm, means for mounting the tone arm for rotation about an axis, a cueing lever lift rod for causing movement of said arm by engagement therewith at a point spaced from the said axis, dash pot means associated with said lift rod for opposing motion thereof, a generally flat spring having one end thereof connected to the lift rod and the other end thereof secured to the mechanism chassis, means defining a fixed shoulder in engagement with one side of the spring which faces said tone arm, and a cueing lever which is rotatable about a substantially horizontal axis and has a portion which engages said spring in an area between the lift rod and the said shoulder and raises said area by physical engagement therewith when the cueing lever is rotated about the said horizontal axis.

4,352,178

CARTRIDGE EQUALIZER

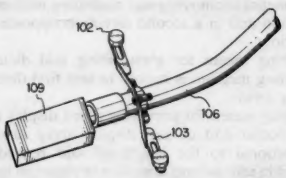
Masaki Kitamura, No. 9-22, 1-chome, Higashi, Okegawashi, Saitama, Japan; Naoki Saisu, Kitamotoshi, and Shigeo Koide, Higashimurayamashi, both of Japan, assignors to Masaki Kitamura, Saitama, Japan

Filed May 14, 1980, Ser. No. 149,831

Claims priority, application Japan, May 17, 1979, 54-66036[U]

Int. Cl.³ G11B *3/16*

U.S. Cl. 369—252 **3 Claims**



1. A cartridge equalizer adapted to be added onto a tone arm comprising:

a crossing rod having a wing section-shape including a central portion, two intermediate portions extending diagonally downward from said central portion and two end portions which extend respectively from the downward-most portions of said intermediate portions;

respective counterweights mounted on respective ones of said end portions of said crossing rod;

means to adjust the position of each of said counterweights on its respective end portion of said crossing rod;

a ring-shaped fitting at said central portion of said crossing rod for fastening the equalizer to a tone arm;

and said ring-shaped fitting comprising means to permit it to be removably fastened to a tone arm at any selected location on said tone arm including positions close to a cartridge mounted on the end of an associated tone arm, said ring-shaped fitting defining a plane substantially perpendicular to the axis of said tone arm;

said ring-shaped fitting removable fastening means comprising a pair of half fittings one of which is secured to said crossing rod central portion and the other of which is a mating separate piece, said fitting halves defining a shape snuggly mating to the cross-sectional shape of a tone arm on which the equalizer is to be fastened, securing means for fastening said separate piece half fitting to the mating half fitting on said central portion with the tone arm sandwiched therebetween;

said crossing rod being formed of thin plate material consisting of a light weight alloy;

the planes of said diagonally extending portions of said crossing rod being substantially parallel to said ring-shaped fitting plane and the planes of said end portions of said crossing rod being substantially at right angles to said ring-shaped fitting plane;

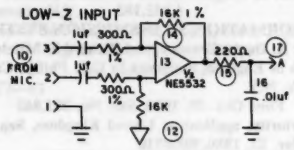
whereby said counterweights can be adjusted towards and away from said tone arm axis individually, and

whereby the entire cartridge equalizer can be adjusted on said tone arm with respect to said cartridge with the use of said ring-shaped fitting with no modification whatsoever to said tone arm.

4,352,179
TIME DOMAIN MULTIPLEXING APPARATUS FOR MULTIPLE MICROPHONES

James H. Dabney, 2700 Peterson Way, Apt. 45 "B", Costa Mesa, Calif. 92626

Filed Jul. 9, 1979, Ser. No. 55,612
Int. Cl.³ H04J *3/02*
U.S. Cl. 370—6 **12 Claims**



1. A time domain multiplexer for feeding an analogue signal input from a plurality of signal sources along a transmission line, comprising:

a. a multiplexer connected by a channel line to each signal source for channel-to-channel switching at switching speeds of about $1.5–2.3\times10^6$ times/second to produce a sample train from the separate channel signals and convert the analog signals to sample pulses at an individual sample rate of about 225 KHz–275 KHz;

b. blanking generator means for producing a time delay of about 100–200 ns between successive sample pulses to prevent sample pulse overlap, thereby reducing cross talk;

c. means to superimpose a synchronizing pulse at the end of each complete sample cycle;

d. a counter for driving the multiplexer and a demultiplexer;

e. a clock generator for producing a clock signal superimposed on the sample cycle and for driving the counters and blanking generator, each sample cycle being identified by a clock signal and synchronizing pulse;

f. means for amplifying and driving the synchronizing pulse, clock signal and sample pulse along the transmission line; and,

g. a demultiplexer for converting the sample pulses to continuous and discrete analog signals, the demultiplexer being driven by decoders for the synchronizing pulses and clock signal pulses.

4,352,180
DIGITAL TIME-DIVISION MULTIPLEX TELECOMMUNICATION SYSTEM

Elmar Schulze, No. 7, Wermuthweg, 1000 Berlin 47, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 141,850
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917675
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—58 **9 Claims**

1. A digital time-division multiplex telecommunication system comprising:

(a) a plurality of subscriber stations,

(b) a plurality of standarized branching nodes,

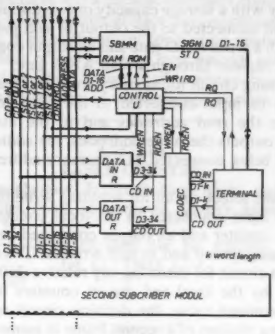
(c) a plurality of two-wire bidirectional transmission lines,

(d) means for providing a plurality of fully synchronized time-division multiplex communication channels on said transmission lines,

(e) means for coupling each of said branching nodes to at least two of said transmission lines, and

(f) means for coupling said subscriber stations to said branching nodes;

(g) said branching nodes comprising:



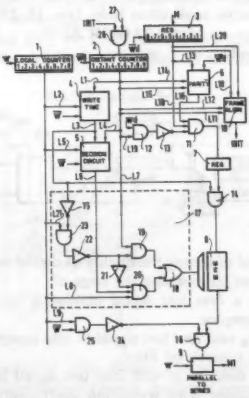
(1) means for establishing a connection in at least one of said channels between a calling subscriber station and a called subscriber station, and

(2) means for controlling establishing said connection whereby said connection occupies said channel only on said transmission lines between said calling station and said called station.

4,352,181
DEVICE FOR SYNCHRONISING MULTIPLEX LINES IN A TIME-DIVISION EXCHANGE

Bernard Le Dieu, Perros Guirec, and Jean-Rene Herledan, Lannion, both of France, assignors to Compagnie Industrielle des Telecommunications CIT-ALCATEL, Paris, France

Filed May 5, 1980, Ser. No. 146,852
Claims priority, application France, May 3, 1979, 79 11094
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—105 **6 Claims**



1. A device for synchronising multiplex lines in a time-division exchange, the multiplex lines conveying PCM encoded signals arranged in time slots grouped into frames, the device comprising:

a local counter with a counting capacity equal to the number of bits in a frame, controlled by a local clock signal;

a distant counter with a counting capacity equal to the sum

of the number of bits of two distant frames, controlled by an inverted distant clock signal representative of timing of said conveyed encoded signals;

an input register;

a parallel register connected to the output of the input register and receiving data in parallel from said input register;

an output register;

a memory with a storage capacity of two distant frames with its input connected to the output of said parallel register through a write AND gate and its output connected to the output register through a read AND gate;

an addressing circuit for memory write and read operations, having its input connected to the local counter which outputs the read addresses and to the distant counter which outputs the write addresses, the addressing circuit output being connected to a memory addressing control input;

a write time select circuit for selecting write times and having an input connected to the local counter and to the distant counter and an output connected to the memory addressing circuit and to said write AND gate;

a decision circuit for detecting any relative shift in the values output by the local and distant counters of less than a predetermined value, the decision circuit responding by imposing readout of a second frame in memory, said decision circuit having its input connected to the local counter, to the distant counter and to the output of the write time select circuit, and having an output connected to an input of the memory addressing circuit; and

a frame alignment circuit for detecting and checking an identification code known as the multiplex frame alignment word and for initialising the distance counter on detection of the frame alignment word, the frame alignment circuit having an input connected to the distant counter and the input register and an output connected to the input of the distant counter.

4,352,182

METHOD OF AND DEVICE FOR TESTING THE QUALITY OF DIGITAL SPEECH-TRANSMISSION EQUIPMENT

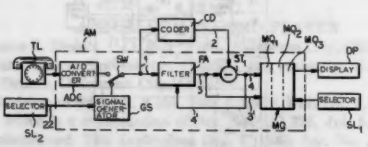
Roberto Billi, Leghorn, and Carlo Scagliola, Genoa, both of Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 12, 1980, Ser. No. 215,796

Claims priority, application Italy, Dec. 14, 1979, 69404 A/79

Int. Cl.³ G01R *27/00*

U.S. Cl. 371—22 **13 Claims**



1. A method of testing the quality of digital speech-transmission equipment, comprising the steps of:

generating a first test signal consisting of a sequence of digital samples;

transmitting said first test signal to said equipment and to an adaptive transversal filter;

modifying samples of said first test signal in said filter by multiplication with weighting coefficients to produce a first corrected signal;

generating a first error signal formed as a difference between said first corrected signal and a first output signal emitted by said equipment in response to said test signal;

feeding said error signal back to said filter;

updating said coefficients in said filter with the aid of said error signal;

upon minimization of said error signal, storing the values of said coefficients last attained as a measure of the characteristics of the linear part of said equipment;

generating a second test signal consisting of a sequence of digital samples;

transmitting said second test signal to said equipment and to said filter;

weighting the samples of said second test signal with the stored values of said coefficients to form a second corrected signal;

generating a second error signal formed as a difference between said second corrected signal and a second output signal emitted by said equipment in response to said second test signal; and

calculating an indication of the transmission quality of said equipment from said second error signal and said second corrected signal.

4,352,183

INFORMATION TRANSMISSION SYSTEM

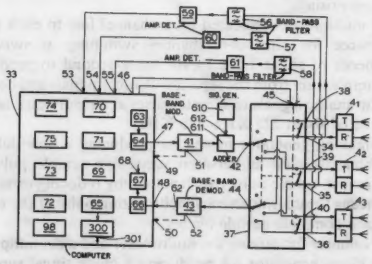
Christopher K. Davis, Crawley, and Richard F. Mitchell, Merstham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,865

Claims priority, application United Kingdom, Sep. 11, 1979, 7938975; Mar. 13, 1980, 8008510

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—33 **3 Claims**



1. An information transmission system having a first transmitter/receiver and a plurality of further transmitter/receivers which can each communicate with said first transmitter/receiver over the same transmission channel or group of transmission channels, characterized in that said first transmitter/receiver comprises:

means for detecting whether any of said channels are free;

means for transmitting on one of said free channels a sequence of identical command signals each having a limited duration, said command signals being separated one from the other by at least a predetermined number of time slots;

means for receiving on said free channel a digital information message from any one of said further transmitter/receivers in each of said predetermined number of time slots;

means for checking said digital information message for errors and, if said digital information message is error-free, for transmitting back, on said free channel, an acknowledgement signal, for the further transmitter/receiver having transmitted said error-free digital information message, prior to the transmission of a next command signal in said sequence of command signals; and

means for assigning, after said sequence of command signals, one of said free channels to each of said further transmitter/receivers to which said acknowledgement signal had been transmitted, for further communication thereon; and characterized in that each of said further transmitter/receivers comprises:

means for scanning said channels and for detecting the chan-

nel on which said first transmitter/receiver is transmitting said sequence of command signals;

means for transmitting on said channel said digital information message in one of said predetermined number of time slots, if communication on one of said free channels is desired;

means for detecting whether said first transmitter/receiver transmitted said acknowledgement signal in response to said digital information message;

means for retransmitting said digital information signal after a next command signal in said sequence of command signals if said acknowledgement signal is not received; and

means for effecting said communication on said free channel assigned by said first transmitter/receiver.

4,352,184

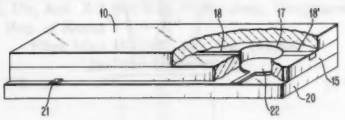
GAS LASER AND METHOD OF MANUFACTURING

Dudley A. Chance, Danbury, Conn., assignor to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 737,375, Nov. 1, 1976. This application Aug. 3, 1978, Ser. No. 930,617

Int. Cl.³ H01S *3/03*

U.S. Cl. 372—61 **16 Claims**



1. In a longitudinally excited gas laser, the improvement comprising a laser body including:

a plurality of communicating gas passages including a plasma tube,

at least a pair of electrodes and a pair of mirrors, said plasma tube located between said electrodes and colinear with said mirrors and wherein

said electrodes comprise metallized layers deposited on a portion of said body.

4,352,185

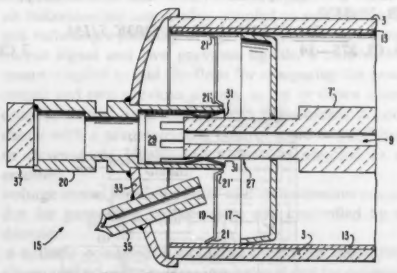
GAS LASER HAVING IMPROVED STABILITY AGAINST ENVIRONMENTAL CONDITIONS

Dale E. Crane, Sunnyvale, Calif., assignor to Uniphase Corporation, Mountain View, Calif.

Filed Jul. 18, 1980, Ser. No. 169,989

Int. Cl.³ H01S *3/13*

U.S. Cl. 372—29 **14 Claims**



1. A gas laser, comprising a hermetically sealed elongated envelope enclosing a generally static gaseous medium capable of supporting stimulated emission of radiation in response to an electric field impressed upon said gaseous medium, electrode means to be energized with a potential difference, disposed spaced apart generally at opposite ends of said envelope to define therebetween an axis along which said electric field extends, a pair of mirrors spaced apart and facing each other along said axis to define therebetween an optical cavity, said mirrors being reflective at a pre-selected wavelength at which said gaseous medium is capable of supporting said stimulated emission of radiation, and a metallic thermally conductive liner means having a significantly greater thermal conductivity than said envelope in good thermally conducting relation with the full inner surface of said envelope over a major portion of the length of said envelope between said mirrors to substantially equalize the temperature of said envelope portion.

4,352,186

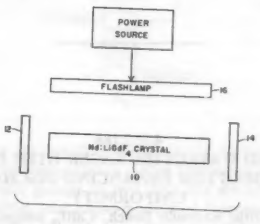
LASER CRYSTAL

John D. Kuppenheimer, Jr., Tewksbury, Mass., and James W. Baer, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 13, 1980, Ser. No. 129,945

Int. Cl.³ H01S *3/14*

U.S. Cl. 372—41 **2 Claims**



1. A crystal, comprising:

a Lithium Gadolinium Fluoride host material; and active ions of Neodymium wherein the concentration of Neodymium ions is higher than four percent.

4,352,187

SEMICONDUCTOR LASER DIODE

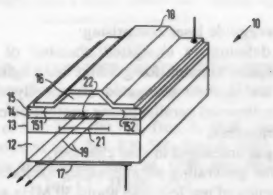
Markus C. Amann, Strassbergerstrasse 9/506c, 8000 Muenchen 40, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,126

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856507

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—46 **7 Claims**



1. A semiconductor laser diode, comprising: a layer sequence of a chromium/gold metal electrode layer connecting to a first electrode terminal, a first highly-doped semiconductor layer of first conductivity type and formed of gallium arsenide, a second semiconductor layer of first conductivity type having a lesser doping than the first layer and formed of gallium aluminum arsenide, a gallium arsenide third semiconductor layer in which a strip shaped laser active zone is to be formed, a fourth semiconductor layer of gallium aluminum arsenide of second conductivity type, and a second electrode

terminal coupled to the fourth semiconductor layer; a resonant cavity means comprised of said strip-shaped laser active zone; and second lesser doped semiconductor layer having a doping level such that the layer forms a junction having a high resistance with the chromium/gold alloy relative to a junction resistance formed between the first layer and the alloy when a voltage is applied to the first and second electrode terminals; the first semiconductor layer having a lateral width dimension orthogonal to a direction of laser propagation chosen to be substantially the same as a desired width of the desired strip-shaped laser-active zone to be formed in the third semiconductor layer; the second semiconductor layer having a substantial part of its thickness removed at regions beyond said lateral width dimension of the first layer and portions of the metal electrode layer being extended to cover the regions; and the reduced thickness region and the width of the first semiconductor layer defining a resultant lateral dimension of the laser active zone when the voltage is applied to the first and second terminals so as to achieve a preferred laser excitation in a basic transversal mode.

4,352,188

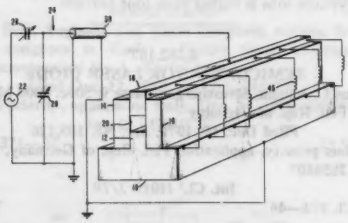
RF PUMPED WAVEGUIDE LASER WITH INDUCTIVE LOADING FOR ENHANCING DISCHARGE UNIFORMITY

Glen A. Griffith, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 3, 1980, Ser. No. 165,524

Int. Cl.³ H01S *3/093*

U.S. Cl. 372—82 **5 Claims**



1. A waveguide laser comprising:

means defining an elongated chamber of cross-sectional dimensions suitable for guiding laser light and including first and second elongated electrically conductive elements disposed parallel to one another on opposite sides of said chamber;

a laser gas contained in said chamber;

means for generating an alternating excitation voltage at a frequency of not less than about 30 MHz and for applying said excitation voltage between said first and second electrically conductive elements to establish a laser-exciting discharge in said laser gas so as to invert the population of the energy levels of the desired laser transition of said gas, said excitation voltage providing in said chamber a standing wave voltage which varies in magnitude along the length of said chamber; and

inductive means coupled between said first and second electrically conductive elements externally of said chamber for reducing the magnitude of the variation of said standing wave voltage.

4,352,189

ATMOSPHERE CONTROL OF SLAG MELTING FURNACE

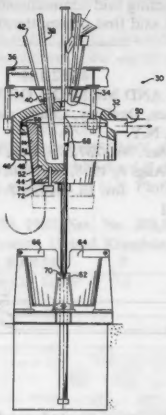
Patrick J. Wooding, Moorestown, N.J., assignor to Wooding Corporation, Moorestown, N.J.

Continuation-in-part of Ser. No. 773,263, Mar. 1, 1977. This application Oct. 11, 1979, Ser. No. 83,585

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ F27D *7/06*

U.S. Cl. 373—45 **30 Claims**



1. An electric furnace for melting slag comprising a crucible including an electrically conductive refractory liner therein; at least one electrode extending into the interior of said crucible; means for sealing the interior of said crucible from the outside atmosphere; means for removing detrimental gases from within said crucible, and means for connecting said liner to an electrical power source whereby said liner will function as an electrode.

4,352,190

DEVICE FOR AUTOMATIC EQUALIZATION OF ELECTRICAL DATA TRANSMISSION CHANNELS

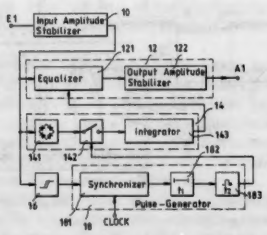
Josef Hullwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Nov. 7, 1980, Ser. No. 205,037

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945332

Int. Cl.³ H04L *25/03;* H03K *5/135*

U.S. Cl. 375—14 **7 Claims**



1. A device for the automatic equalization of an electrical data signal of the type having zero level transitions comprising:

an equalizer unit having an input connected to receive said

data signal, an output for said data signal after equalization, and a control input for receiving a regulating signal;

a regulating signal generator having an input connected to receive the data signal and comprising a rectifier unit, an integrator having an input, an output, and an integration time corresponding to a multiple of the basic interval between zero level transitions of the data signal, and a switch connected in series between the rectifier and the integrator input and adapted to be controlled by a clock signal for periodic, transient feeding of the rectified data signal to the integrator;

a clock signal generator having an input connected to receive the data signal and responsive thereto to produce a clock signal output synchronized with the ideal points in time of said zero level transitions;

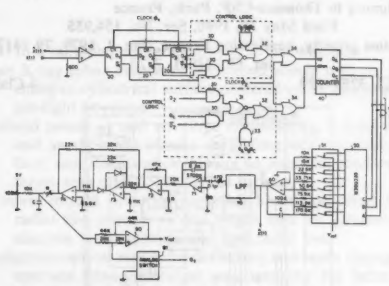
said clock signal output being connected to the switch to control said periodic, transient feeding;

the integrator output being connected to the control input of the equalizer unit.

4,352,191
HYBRID COMPANDING DELTA MODULATION SYSTEM

Chong K. Un, Apt. E-1 San 4-51 Hoeki-dong, Dongdaemun-ku, Seoul, Rep. of Korea

Filed May 19, 1980, Ser. No. 151,330
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—30 **17 Claims**



1. A hybrid companding delta modulation system comprising:

a. a comparator for comparing a system input signal and a predicted signal and for generating digital output signals sampled in accordance with a clock signal;

b. an instantaneous compandor coupled to said comparator and including a plurality of flip-flops for storing a present output signal and two previous signals, a control logic means coupled to said flip-flops for comparing the present output and two previous signals, an up or down counter coupled to and controlled by said logic means in accordance with a predetermined control logic to produce up or down logic levels, and a decoder coupled to said counter;

c. voltage means forming part of said instantaneous compandor for generating voltage steps and controlled by said decoder;

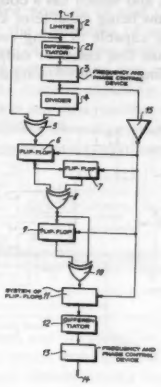
d. a syllabic compandor including means for measuring a characteristic of the system input signal and for generating a reference voltage, thereby to control the voltage step size of said voltage means; and

e. a prediction filter coupled between said voltage means and said comparator for supplying the predicted signal varying both in accordance with the slope variations of the system input signal and said control logic means output in accordance with variations of the system input signal.

4,352,192
TIMING SIGNAL SYNCHRONIZATION DEVICE

Andre Perez; Jean M. Boljevic, and Alain Dautremay, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 29, 1980, Ser. No. 154,305
Claims priority, application France, Jun. 1, 1979, 79 14181
Int. Cl.³ H04L *7/06*
U.S. Cl. 375—56 **3 Claims**



1. A device for synchronizing a local timing signal with respect to a first timing signal, whose frequency F_1 is the same as that at which groups of two data bits are transmitted by means of a differential phase-modulated frequency carrier F, F_1 being equal to (2F/3), comprising a carrier wave limiter having an output for supplying a first signal, a differentiating circuit having an input coupled to the output of the limiter and an output, a first frequency and phase control device for supplying a second timing signal whose frequency is equal to quadruple the carrier frequency F having an input coupled to the output of the differentiating circuit and an output, a frequency divider by four having an input coupled to the output of the first frequency and phase control device and an output for supplying a second signal, a device for detecting the phase change position of the carrier wave performing a correlation sequence from the first signal and the second signal having a first and a second input coupled respectively to the output of the divider and to the output of the limiter and an output for supplying pulses representative of the position of the phase jumps, and a second frequency and phase control device having an input coupled to the output of the detection device and an output for supplying a local controlled timing signal.

4,352,193
INTENDED VALUE DETERMINATION SYSTEM

William F. Acker, Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

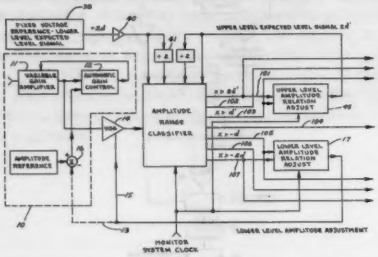
Continuation of Ser. No. 100,751, Dec. 5, 1979, abandoned, which is a division of Ser. No. 829,705, Sep. 1, 1977, Pat. No. 4,207,523. This application Nov. 24, 1980, Ser. No. 210,093
Int. Cl.³ H04B *1/10*
U.S. Cl. 375—76 **6 Claims**

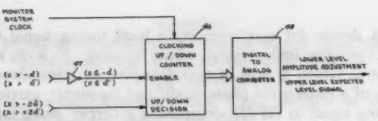
1. An expected signal level decision means to establish, for a corrupted incoming signal recognized as a sequence of data samples, that expected level signal which those said data samples within a selected range thereof are expected to substantially equal if said incoming signal were not so corrupted, said expected level decision means comprising:

an incoming signal amplitude range classifier for determining whether said data samples from said incoming signal are within certain amplitude ranges and having first and second classifier outputs, said incoming signal amplitude range classifier being capable of providing (i) as a first

classifier output signal an indication for each said data sample, at said first classifier output, whether that said data sample has a value that is within said selected range, and providing (ii) as a second classifier output signal an indication for each said data sample, at said second classifier output, whether that said data sample has a value above or below that of said expected level signal;

a counter means connected to both said first and second classifier outputs, and which has a counter means output, said counter means being capable of keeping count total therein and being capable of being enabled to alter said count total by said first classifier output signal and said counter means being capable of being directed whether to





increase or decrease said count total by said second classifier output signal, said counter means being capable of providing at said counter means output, as said counter means output signal, a signal having a value which indicates whatever count total has been reached in said counter means; and

an incoming signal-expected level adjustment means having an adjustment means input connected to said counter means output, said incoming signal-expected signal level adjustment means being capable of adjusting an amplitude relationship occurring between said incoming signal and said expected signal level in response to said counter means output signal.

4,352,194

SYSTEM AND METHOD FOR FREQUENCY DISCRIMINATION

Michael G. Caracappa, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,214

Int. Cl.³ H04L *27/14*

U.S. Cl. 375—89 **12 Claims**

1. In a system employing N time synchronous tone segments which are sampled at a sampling rate $1/T_1$ and each having one of N predetermined frequencies, means for determining the frequency of each tone segment and comprising:

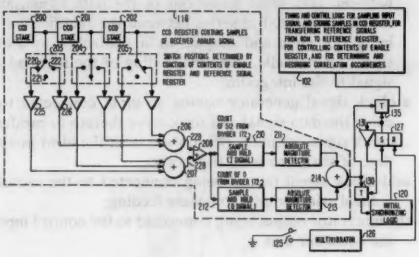
first shift register means having M stages;

second register means having at least M stages each being aligned with one of the M stages of said first shift register means;

means for sampling each received tone segment into P samples where $P<M$ and $M-P=L$, and for entering said P samples into said first shift register means;

means for generating 2N(I and Q) reference tones each being P bits in length and each having one of said N predetermined frequencies;

means for successively entering the P bits of said 2N(I and Q) reference tones into said second register means at a rate $R_2 \geqq 2MN/LT_1$ in successively displaced positions in said second register means so that each reference tone is aligned with the sampled received tone segment whose frequency is being determined; and



logic means for comparing the sampled tone segment with each reference tone to determine which reference tone correlates most closely with said sampled tone segment.

4,352,195

DEVICE FOR THE SYNCHRONIZATION OF A TIMING SIGNAL

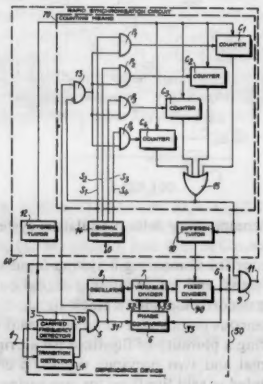
Alain Dautremay, and Jean M. Boljevic, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 30, 1980, Ser. No. 154,955

Claims priority, application France, Jun. 1, 1979, 79 14178

Int. Cl.³ H03L *7/18*

U.S. Cl. 375—120 **4 Claims**



1. A device for the synchronization of a local timing signal with respect to a data signal, wherein it comprises: a dependence device incorporating a data signal transition detector having an output, a phase comparator for determining the position of the transitions relative to the rising front of the local timing signal and having an input coupled to the output of the detector and an output, and a local timing signal generator having in series an oscillator, a divider with a variable dividing number coupled to the oscillator and having a control input coupled to the output of the phase comparator, and a fixed divider, coupled to the divider having a variable dividing number and having an initiating input and an output, a rapid synchronization circuit comprising counting means for counting the number of coincidences of n successive transitions detected (n equals positive integer) with each of k separate time intervals (k equals positive integer) of the same duration,

dividing up the integrality of each local timing signal cycle and for supplying a pulse as from the time at which p coincidences with one of the k time intervals have been counted, having a signal input coupled to the output of the transition detector, an output coupled to the initiating input of the fixed divider and a counting control input coupled to the output of the fixed divider.

4,352,196

X-RAY TUBE FOR PRODUCING A FLAT WIDE-ANGLE FAN-SHAPED BEAM OF X-RAYS

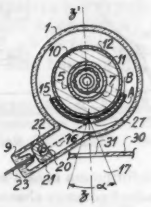
Emile Gabbay, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Continuation of Ser. No. 871,994, Jan. 24, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,691

Claims priority, application France, Jan. 28, 1977, 77 02456

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—125 **6 Claims**



1. In a radiodiagnostic apparatus, in combination:

an X-ray tube comprising a rotating anode with an X-ray-emissive cylindrical surface centered on an axis in a vacuum-tight envelope;

shield means in said envelope enshrouding at least part of said anode while closely paralleling said cylindrical surface, said shield means having an aperture confronting a target area of said cylindrical surface;

means in said envelope including a cathode offset from a radial line normal to said target area for generating an electron beam approaching said radial line;

electron-optical means for deflecting said beam through said aperture onto said target area whereby the latter emits X-radiation traversing said aperture; and

a diaphragm separated by said shield means from said cylindrical surface and disposed in a plane transverse to said axis including said radial line, said diaphragm having a slit in said transverse plane aligned with said aperture for letting said X-radiation spread within said plane into a fan-shaped beam adapted to illuminate an array of X-ray detectors.

4,352,197

MOUNTING DEVICE FOR AN X-RAY FILM CASSETTE

Hans Waerve, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 16,293, Feb. 28, 1979, Pat. No. 4,247,778. This application Sep. 4, 1980, Ser. No. 183,944

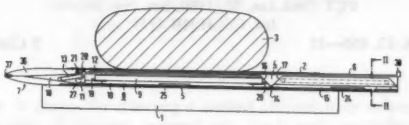
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811765

The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—177 **3 Claims**

1. A cassette mounting assembly comprising a cassette mounting device (4) of configuration to be disposed in underlying relation to a patient, said cassette mounting device having a cassette chamber (8) into which an X-ray film cassette can be inserted; and said cassette chamber (8) being movable in said cassette mounting device (4) from a first position in underlying relation to a patient, to a second position displaced by about 90° with respect to said first position and disposed laterally of a patient while the cassette mounting device (4) remains in said underlying relation to the patient, said cassette mounting device (4) having an upper wall (6) of a material that is permeable to X-ray beams for underlying a patient to be examined and for overlying said cassette chamber (8) in said first position thereof, said cassette mounting device (4) consisting of components all of which lie essentially below the level of said upper wall (6) in said first position of said cassette chamber, and means comprising the disposition of said components essentially below the level of said upper wall (6) providing an unobstructed space above the level of said upper wall (6) over the entire extent of the cassette mounting device (4) when said cassette chamber is in said first position, said cassette mounting device having a laterally extending receiving space below said upper wall (6) accommodating said cassette chamber (8) in said



first position thereof, and providing for movement of the cassette chamber in a lateral direction, and having a lateral opening at one lateral side thereof leading from said receiving space and of a size to accomodate removal of the cassette chamber (8) from said first position and out of said receiving space, and hinge means for coupling said cassette chamber with said cassette mounting device at said one lateral side thereof such that when the cassette chamber has been moved out of said receiving space through said lateral opening said hinge means couples said cassette chamber with said cassette mounting device for pivotal movement through about 90° and into said second position with said cassette chamber extending upwardly from said lateral opening at one lateral side of a patient overlying said upper wall of said cassette mounting device, and said cassette mounting device having means comprising said hinge means for fixing said cassette chamber in said second position for the taking of a lateral X-ray photograph.

4,352,198

X-RAY PHOTOGRAPHY CASSETTE

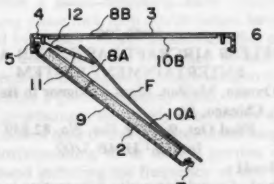
Osamu Fukushima; Masahide Akisada; Yoshiyuki Monma, all of Minami-ashigara, and Kazuaki Kitamura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 25, 1980, Ser. No. 115,326

Claims priority, application Japan, Jan. 26, 1979, 54-8043

Int. Cl.³ G03D *41/16*

U.S. Cl. 378—185 **5 Claims**



1. An X-ray photography cassette comprising a cassette body including a frame and a front plate coupled to said frame, hinge members for coupling a rear cover to said body, first and second intensifying screens positioned adjacent inner surfaces of said front plate and said rear cover, respectively, a peeling member adapted to peel a film loaded in said cassette off said second intensifying screen, said peeling member being coupled

to said body at an inward point where said rear cover is hinged to said body in such a manner that said peeling member is in alignment with a cut-out portion formed in said second intensifying screen and is moved outward from said cut-out portion when said rear cover separates from said body to separate said film from said second intensifying screen, and a space being provided between said peeling member and said first intensifying screen for receiving said film to lie on said second intensifying screen.

4,352,199

METHOD AND DEVICE FOR DETECTING AND INTERPRETING A DISTRESS SIGNAL

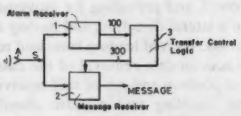
Roger Rogard, Verdistraat 16, 2162 AV - Lisse, Netherlands

PCT No. PCT/EP80/00003, § 371 Date Sep. 24, 1980, § 102(e) Date Sep. 24, 1980, PCT Pub. No. WO80/01631, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 25, 1980, Ser. No. 205,447

Int. Cl.³ H04B *1/59*

U.S. Cl. 455—31 **5 Claims**



1. An emergency telecommunication process for producing a distress signal repeatedly transmitted from a mobile station in successive sequences and for detecting and interpreting the distress signal with a high reliability at a shore terminal, said process comprising the steps of:

transmitting in each sequence of the distress signal, an alarm signal during a first time interval and a message signal during a second time interval, said alarm signal being only comprised of a carrier phase-modulated by a sub-carrier and said message signal being comprised of a carrier which is phase-modulated by a sub-carrier to which the information is superimposed by binary phase modulation;

detecting the alarm signal at a shore terminal during said first time interval for producing a command signal indicating the occurrence of a distress signal; and

controlling and demodulating the message signal during said second time interval in response to said command signal so as to restore the distress message.

4,352,200

WIRELESS AIRCRAFT PASSENGER AUDIO ENTERTAINMENT SYSTEM

Martin H. Oxman, Malden, Mass., assignor to Bell and Howell Company, Chicago, Ill.

Filed Oct. 9, 1979, Ser. No. 82,849

Int. Cl.³ H04B *5/00*

U.S. Cl. 455—41 **25 Claims**

1. A method of supplying audio information in several audio channels via headsets to passengers seated aboard an aircraft in rows of seats including armrests and being distributed along an elongate passenger section inside a metallic fuselage, comprising in combination the steps of:

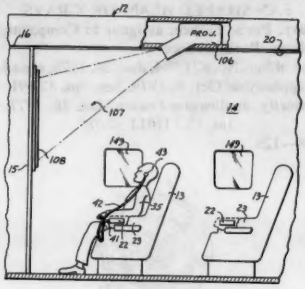
running a transmitting antenna along the passenger section of said aircraft for radio transmission inside such elongate passenger section in a frequency range including at least a band between 72 and 73 MHz;

providing individual antennas for said seats for receiving said radio transmission and distributing such receiving antennas among predetermined armrests of said seats;

providing said audio information in radio frequency channels in said band between 72 and 73 MHz;

coupling said distributed receiving antennas via seated passengers to said transmitting antenna;

transmitting said radio frequency channels in said band via said transmitting antenna, seated passengers and distributed receiving antennas to said predetermined armrests;



deriving said audio information in said audio channels from said transmitted radio frequency channels in said predetermined armrests;

individually enabling passengers to select audio information from among audio channels containing said derived audio information; and

applying said selected audio information individually to said headsets.

4,352,201

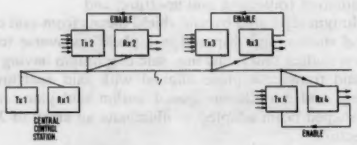
DATA TRANSMISSION SYSTEM

Geoffrey D. Miller, Plymstock, England, assignor to M.L. Engineering (Plymouth) Limited, England

Filed Apr. 30, 1979, Ser. No. 34,510

Int. Cl.³ H04B *3/50*

U.S. Cl. 455—58 **5 Claims**



1. A data transmission system comprising a plurality of transmitters, a communication channel, and a receiver arranged to receive data transmitted from the individual transmitters sequentially over said communication channel, each said transmitter comprising:

first timing means which, during periods when it is enabled, is arranged to time a first time interval, the first timing means being further arranged to generate an output signal upon completion of the timing of said first interval,

a channel signal detector coupled to said communication channel and arranged to generate an output signal in the absence of a signal or noise on said channel,

control means connected to said signal detector and said first timing means and responsive to the presence of the signal-detector output signal to enable the first timing means only during the absence of detected signal or noise on said channel,

signal transmission means coupled to said communication channel and operative in response to the generation of a

said output signal by the first timing means to transmit a data message of predetermined duration in signal form over said channel to said receiver, and

inhibit means which, following the transmission of a said data message by said signal transmission means, is operative to prevent said transmission means from transmitting a further said data message over said channel for a second time interval the duration of which is sufficient to allow the other said transmitters to sequentially transmit their associated data messages, said inhibit means including second timing means for timing said second time interval,

the duration of said first time intervals differing for each said transmitter by random delays whereby upon initial operation of the system, the transmitters will transmit in a sequence randomly established by the relative duration of their said first intervals, and therefor this sequence is maintained.

4,352,202

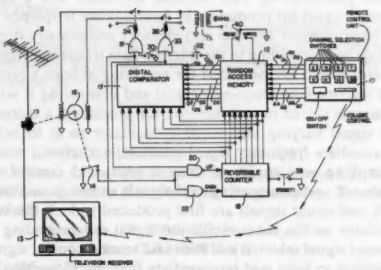
COMBINED REMOTE CONTROL FOR WIRELESS COMMUNICATION EQUIPMENT AND ASSOCIATED ANTENNA

Richard E. Carney, 6253 Longford Dr., Citrus Heights, Calif. 95610

Continuation-in-part of Ser. No. 72,174, Sep. 4, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,467

Int. Cl.³ H04B *7/08;* **H02P** *1/04;* **G05B** *19/20*

U.S. Cl. 455—151 **3 Claims**



1. In combination with a remote control unit for wireless equipment which is capable of tuning the equipment to any one of a plurality of pre-selected signal channels, said remote control unit generating binary-coded signals representative of the plurality of pre-selected signal channels, and control apparatus connected to said remote control unit for causing the antenna associated with said wireless equipment to be rotated to pre-selected angular positions so as to provide optimum processing of signals in each of the pre-selected signal channels, said wireless equipment having an associated antenna and said control apparatus including: an electric motor coupled to the antenna for rotating the antenna to pre-selected angular positions; means mechanically connected to the motor for generating electrical signals indicative of the pre-selected angular positions as the antenna rotates; binary counter means electrically connected to the generating means for generating binary signals in response to said electrical signal; memory means electrically connected to the counter means for storing the binary signals from the counter means corresponding to pre-selected angular positions of the antenna in predetermined address locations in the memory means, and said memory means being electrically connected to said remote control unit and responsive to the binary signals therefrom selectively to address the binary signals stored in the memory means at the pre-selected memory locations; comparator means connected to the memory means and to the counter; and control and drive circuitry connecting said comparator means to said electric motor to cause the electric motor to rotate the antenna to the pre-selected angular positions.

4,352,203

STATION SELECTING DEVICE

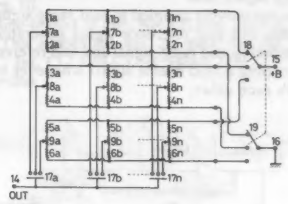
Wataru Ohkubo, Soma, Japan, assignor to Alps Electric Company, Ltd., Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 175,952

Claims priority, application Japan, Aug. 11, 1979, 54-110843[U]

Int. Cl.³ H04B *1/16;* **H03J** *5/32*

U.S. Cl. 455—176 **2 Claims**



1. A device for selecting a desired channel from among a plurality of channels grouped into bands each containing a predetermined number of said channels; comprising a plurality of variable resistors each corresponding to a respective channel and connected so that the variable resistors corresponding to the channels of each band are connected in a respective parallel circuit with one another; supply means for selectively applying a voltage to each resistor of the parallel circuit containing a variable resistor corresponding to the desired channel, said supply means including a first switch for connecting a source of voltage to each resistor of the parallel circuit containing a variable resistor corresponding to the desired channel and a second switch for grounding each of said resistors connected to said source of voltage; and means including a plurality of channel switches each connected to one variable resistor only within each parallel circuit for enabling the desired channel to be selected by actuating only said supply means and an appropriate channel switch.

4,352,204

ENTRY APPARATUS OF DIGITAL VALUE IN MEMORY

Tsutomu Ohgishi, Hirakata, and Tadashi Sakurai, Neyagawa, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 825,183, Aug. 17, 1977, abandoned. This application Sep. 27, 1979, Ser. No. 79,537

Claims priority, application Japan, Aug. 25, 1976, 51-102926; Sep. 17, 1976, 51-113435

Int. Cl.³ H03J *5/00*

U.S. Cl. 455—182 **15 Claims**

1. Apparatus for tuning a radio receiver to select a station for reception within a given frequency band comprising tuner means including phase lock loop circuit means having oscillating means and frequency control means including programmable means for controlling the frequency of said oscillating means for selecting a first signal corresponding to the station to be selected within a given frequency band,

means for generating a reptitively changeable digital value as a function of time over a predetermined range of digital values corresponding to at least a portion of said frequency band including the frequency of said first signal,

memory means coupled to said changeable digital value generating means and responsive to a load enable signal for loading in said memory means the digital value obtained from said changeable digital value generating means which corresponds to said first signal,

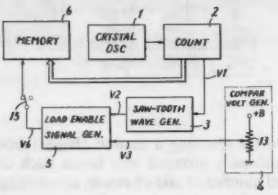
means operatively coupled to said changeable digital value generating means for providing to said memory means a load enable signal in synchronism with and at a predetermined phase time of the repetitive change of said change-

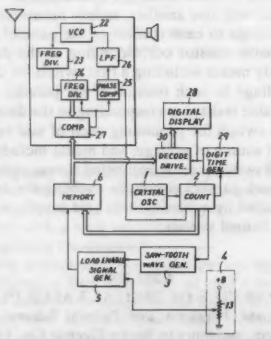
able digital value corresponding to said first signal, said load enable signal providing means including:

means responsive to said changeable digital value generating means for generating a ramp signal in synchronism with the repetitive change of said changeable digital value, said ramp signal having a waveform changeable as a function of time in synchronism with the repetitive change of said changeable digital value,

analog operated continuously tunable control means for generating a reference signal to be compared with said ramp signal, and

means operatively coupled to said ramp signal generating means and said reference signal generating means for comparing said ramp signal and said reference signal for providing a load enable signal whenever both coincide with each other,





the operation of said analog operated control means selectively adjusting the phase time of said load enable signal whereby a digital value obtainable from said changeable digital value generating means at the phase time, as adjusted by said control means, is loaded in said memory means responsive to the load enable signal,

and first means for operatively coupling said frequency control means of said phase lock loop circuit means to said memory means for providing said programmable means of said frequency control means with a signal corresponding to the frequency of said first signal in accordance with the digital value loaded in said memory means to thereby control the frequency of said oscillating means for enabling selection of said first signal associated with said digital value as adjusted by said control means.

4,352,205

TUNING SYSTEM

Masaki Kato, and Katsumi Tobita, both of Soma, Japan, assignors to Alps Electric Company, Ltd., Tokyo, Japan

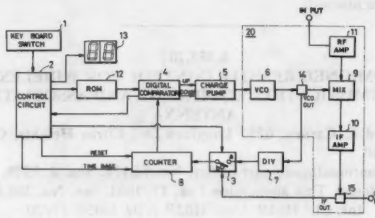
Filed May 16, 1980, Ser. No. 150,296

Claims priority, application Japan, May 16, 1979, 54-60053

Int. Cl.³ H03J *7/18, 5/24*

U.S. Cl. 455—183 **11 Claims**

1. In a tuning system for selected and tuning a channel signal selected from any one of a plurality of channel signals in the service area of the system; including a variable oscillator responsive to control signals for producing a local oscillation signal; means including a counter receiving signals from said variable oscillator for producing a count signal corresponding to the frequency of said local oscillation signal; means includng a memory for storing signals corresponding to the count signal desired when the variable oscillator is producing the proper local oscillation signal for the channel signal selected; and means including a comparator receiving both said count signals and the signals stored in said memory corresponding to the selected channel signal for producing said control signals for said variable oscillator whereby said variable oscillator will produce the local oscillation signal corresponding to the channel signal selected; and means mixing the local oscillation



signal produced by said variable oscillator and a received channel signal for producing an intermediate frequency signal; the improvement wherein said memory additionally storing IF signals corresponding to the intermediate frequency signal, and control means are provided for receiving at least a portion of said intermediate frequency signal and comparing it with said IF signals stored in said memory for producing a second control signal varying said variable oscillator so as to hold said intermediate frequency signal constant, and circuit means for controlling said tuning system so that said control signals produced upon comparing said signals stored in said memory with said count signals are first produced to lock the variable oscillator on the local oscillation signal corresponding to the channel signal selected and then said second control signals are produced to hold said intermediate frequency constant.

4,352,206

COMPARISON ARRANGEMENT FOR A DIGITAL TUNING SYSTEM

Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,619

Claims priority, application United Kingdom, Apr. 8, 1980, 8011554

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—184 **5 Claims**

1. In a tuning system for a receiver, apparatus comprising:

station selection means for generating a station-representative digital word having M bits;

local oscillator means for generating a local oscillator signal having a frequency controlled in response to a tuning signal;

timing means for generating a measurement pulse;

counter means for couting periods of said local oscillator signal during the duration of said measurement pulse to produce a count-representative digital word having N bits, where N is less than M;

comparison means for generating at least one comparison signal representing the deviation between said station-representative digital word and said count-representative digital word;

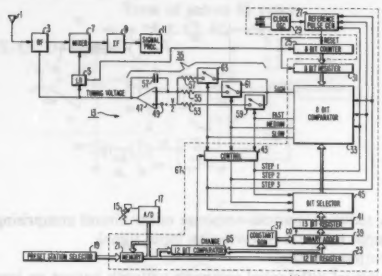
tuning signal generating means for generating said tuning signal in response to said comparison signal;

control means for generating a plurality of step-representa-

tive control signals representing respective successive operating steps;

bit selection means for selectively applying groups of successively lower order bits, N in number, including at least some of the bits of said station-representative digital word, to said comparison means in response to respective successive step-representative control signals; and

measurement interval control means for selectively setting



the duration of said measurement pulse to successively higher values corresponding to the order of respective groups of said N bits applied to said comparison means in response to respective successive step-representative control signals;

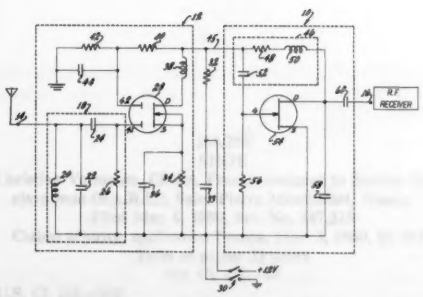
said control means generating the step-representative signal representing the next successive operating step when said comparison signal represents a deviation less than a predetermined deviation.

4,352,207

NOISE SUPPRESSION CIRCUIT

James A. Cross, Azusa, and John E. Snyder, Diamond Bar, both of Calif., assignors to R.F. Technical Products, Inc., Diamond Bar, Calif.

Filed Apr. 18, 1980, Ser. No. 141,603
Int. Cl.³ H04B *1/10*
U.S. Cl. 455—223 **5 Claims**



1. A circuit for insertion between a receiving antenna and an RF receiver to suppress noise in an RF signal received by the receiving antenna, said circuit comprising:

a bandpass filter circuit including a parallel tuned circuit connected to the receiving antenna to receive the RF signal, for attenuating components of the RF signal that have frequencies outside of the pass band of said bandpass filter circuit and for thereby producing a filtered RF signal; and,

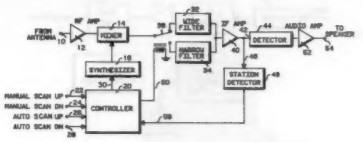
a blanking circuit including a JFET responsive to the filtered RF signal to remove from the filtered RF signal those portions of the filtered RF signal that exceed a preset voltage and to pass the remainder of the filtered RF signal to the RF receiver, said blanking circuit also comprising a series tuned circuit connected between the drain and the gate of said FJET, said series tuned circuit being tuned to the same frequency as said parallel tuned circuit.

4,352,208

AUTOMATIC IF SELECTIVITY FOR RADIO RECEIVER SYSTEM

Daniel R. Schroeder, Glen Ellyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 127,006, Mar. 4, 1980, abandoned. This application Apr. 23, 1981, Ser. No. 256,760
Int. Cl.³ H03J *3/08*; H04B *1/16*
U.S. Cl. 455—266 **4 Claims**



1. In a bandwidth switching system for a radio receiver capable of switching the bandwidth of an intermediate frequency stage of the receiver from a first bandwidth to a second bandwidth automatically, the improvement comprising:

means for scanning predetermined broadcast channels,

means for receiving signals from said scanning means and providing predetermined IF bandwidths in response thereto;

said signal receiving means being further characterized by having a first mode of operation with a first bandwidth and a second mode of operation with a second bandwidth;

detector means for receiving the predetermined IF bandwidth signals from the signal receiving means and converting the signals into audio signals,

station detector means coupled to an output of said signal receiving means for detecting the presence of a predetermined channel having a signal of sufficient strength within the predetermined IF bandwidth and for supplying an output signal to said scanning means if such signal is present so as to enable said scanning means to operate to scan up and down at least one adjacent channel spacing; and

controlling means for controlling the mode of operation of said signal receiving means in response to signals received from said station detector means whereby either said first mode of operation or said second mode of operation is selected depending upon whether an adjacent channel of predetermined magnitude is detected and for controlling the scanning means to operate to respectively scan down or up at least one adjacent channel spacing back to said predetermined channel.

4,352,209

UP-DOWN FREQUENCY CONVERTER FOR CABLE T.V.

John Ma, 3622 Winnetka Rd., Glenview, Ill. 60025

Filed Mar. 23, 1981, Ser. No. 242,908
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—315 **5 Claims**

1. An up-down dual conversion frequency converter for converting selected ones of a plurality of received cable television signals to a predetermined broadcast frequency for display by a television receiver comprising:

a substantially quadrilateral electrically conductive housing enclosed on the top and bottom by generally planar electrically conductive shields;

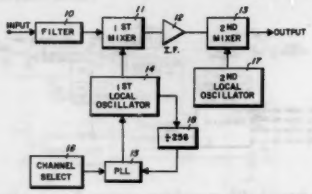
first and second local oscillators located in said housing, said first local oscillator being tunable to produce frequencies above the frequency of said cable television signals and

said second local oscillator being fixed to a frequency less than the frequency of said first oscillator;

first and second mixers located in said housing and coupled respectively to said first and second local oscillators;

a signal input circuit in said housing coupled to said first mixer, positioned adjacent a first corner of said housing and receiving said plurality of cable television signals;

an output signal circuit in said housing coupled to said second mixer, positioned adjacent a second corner of said housing and providing said predetermined broadcast frequency; and



a pair of electrically shielded tuned cavities coupled between said first and second mixers to electrically isolate said input signal circuit, first oscillator and first mixer from said output signal circuit, second oscillator and second mixer,

a signal input terminal and a signal output terminal respectively coupled to said input and output circuits and respectively located adjacent said first and second housing corners, said terminals being alternatively locatable on either one of a respective pair of housing sides adjacent said respective first and second corners without performance degradation of said frequency converter.

4,352,210

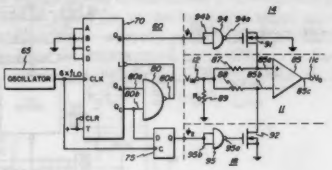
LINEAR MIXER WITH REDUCED SPURIOUS RESPONSES

Charles M. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,686

Int. Cl.³ H04B *1/26, 1/10*

U.S. Cl. 455—317 **9 Claims**



1. A reduced-spurious-response mixer circuit comprising:

an input terminal receiving an input signal;

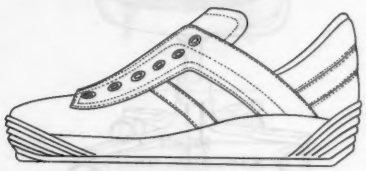
an output terminal;

a balanced differential summing network having an inverting input, a non-inverting input and an output connected to said output terminal;

first and second switch means for selectively coupling said input signal from said input terminal respectively to said summing network inverting and non-inverting inputs responsive respectively to first and second local oscillator signals; and

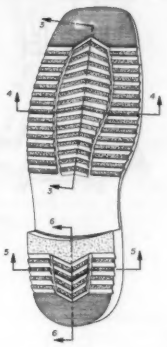
means for providing said first and second local oscillator signals as digital waveforms each having first binary values for one-third of a time interval equal to the reciprocal of the local oscillator frequency, and having a second binary value at all other times, said first and second signals being offset from one another by a time interval equal to one-half the local-oscillator time interval, to cause the third harmonic of said local oscillator frequency to have an essentially zero magnitude in a waveform resulting at said output terminal.

266,285
SHOE
Christian Vermonet, Cholet, France, assignor to Societe Technisynthese (S.A.R.L.), Saint Pierre Montlimart, France
Filed May 6, 1980, Ser. No. 147,322
Claims priority, application France, Mar. 3, 1980, 80 382
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—309

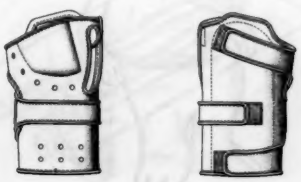


266,286
SHOE
Christian Vermonet, Cholet, France, assignor to Societe Technisynthese (S.A.R.L.), Saint Pierre Montlimart, France
Filed May 6, 1980, Ser. No. 147,325
Claims priority, application France, Mar. 3, 1980, 80 382
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—309

266,287
SHOE SOLE
Malcolm G. Blissett, Grand Rapids, Mich.; Arthur W. Bowen, Quechee, and James H. Lucarelli, Brownsville, both of Vt., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 14, 1980, Ser. No. 178,198
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



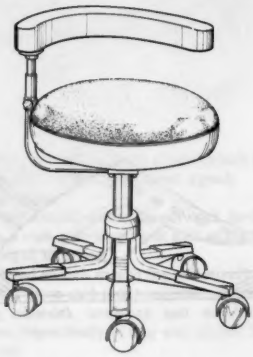
266,288
BOWLING GLOVE
Richard H. Coon, 10758 188th St., Miami, Fla. 33157
Filed Jun. 23, 1980, Ser. No. 161,767
Term of patent 14 years
Int. Cl. D02—*06*
U.S. Cl. D2—361



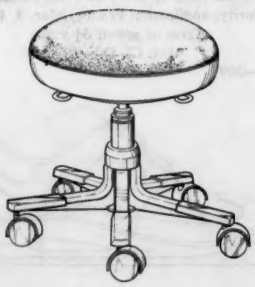
266,289
COLLAR FOR TASSELS
Kenneth E. Kampfe, Omaha, Nebr., assignor to Willsie Cap and Gown Company, Omaha, Nebr.
Filed Mar. 7, 1980, Ser. No. 128,088
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—448

266,290
CHILD'S CHAIR
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Apr. 18, 1980, Ser. No. 141,470
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—12

266,291
CHAIR
Dennis F. Leffler, Charlotte, and Danny M. Truette, Pineville, both of N.C., assignors to The Pelton & Crane Company, Charlotte, N.C.
Filed Mar. 3, 1980, Ser. No. 126,237
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

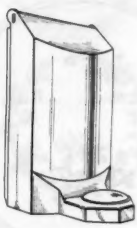


266,292
STOOL
Dennis F. Leffler, Charlotte, and Danny M. Truette, Pineville, both of N.C., assignors to The Pelton & Crane Company, Charlotte, N.C.
Filed Mar. 3, 1980, Ser. No. 126,793
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35

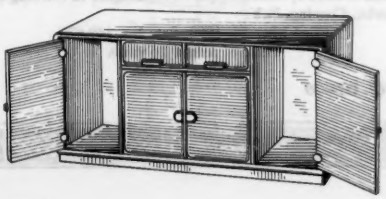


266,293
CHAIR
Ernesto Radaelli, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate, Italy
Filed Mar. 19, 1980, Ser. No. 131,650
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

266,294
FLUID DISPENSER
Paul J. O'Halloran, Grand Prairie, and Glen Morgan, Ft. Worth, both of Tex., assignors to HOH, Inc., San Antonio, Tex.
Filed Dec. 10, 1980, Ser. No. 215,052
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

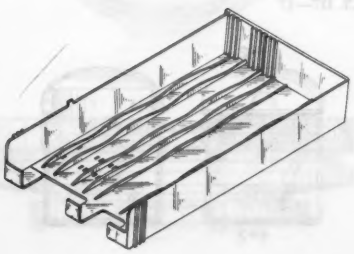


266,295
BUFFET CABINET
Colman Zola, 58 Tamarack Way, Pleasantville, N.Y. 10570
Filed Sep. 12, 1980, Ser. No. 186,525
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—159



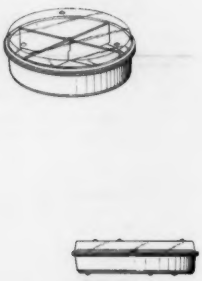
266,296
TABLE
Gregory D. Bergquist, Mountain Brook, and John A. Jones, Trussville, both of Ala., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Oct. 1, 1980, Ser. No. 192,748
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

266,297
DISPENSING RACK FOR ROLLING GOODS
Marvin Zaro, New York, N.Y., assignor to Advertising Displays Company, Englewood, N.J.
Continuation-in-part of Ser. No. 29,089, Apr. 11, 1979. This application Feb. 1, 1980, Ser. No. 117,586
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—199

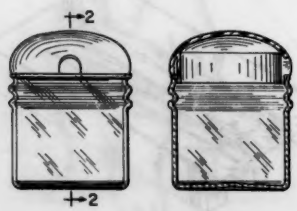


266,298
CUP OR THE LIKE
Loretta H. Moskal, Glen Riddle, Pa., assignor to Corning Glass Works, Corning, N.Y.
Filed Oct. 17, 1980, Ser. No. 197,922
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

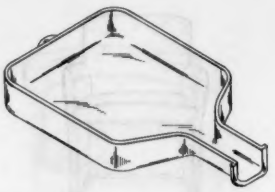
266,299
FOOD STORAGE CONTAINER
Andrew V. Taylor, Sydney, Australia, assignor to Tayclox Industries Pty. Limited, Hornsby, Australia
Filed May 16, 1980, Ser. No. 150,612
Term of patent 14 years
Int. Cl. D7—*01, 07*
U.S. Cl. D7—17



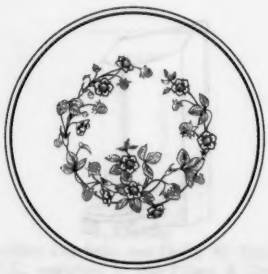
266,300
COVERED SUGAR BOWL OR THE LIKE
Richard V. Haner, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 20, 1980, Ser. No. 179,891
Term of patent 14 years
Int. Cl. D7—*01, 06*
U.S. Cl. D7—17



266,301
HANDYMAN TRAY
Ardal F. Hall, 4007 W. Glenn Dr., Phoenix, Ariz. 85021
Filed Oct. 15, 1980, Ser. No. 197,230
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—19

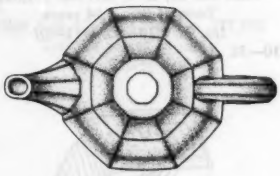


266,302
PLATE OR THE LIKE
Loretta H. Moskal, Glen Riddle, Pa., assignor to Corning Glass Works, Corning, N.Y.
Filed Oct. 17, 1980, Ser. No. 197,923
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—26

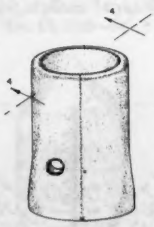


266,303
DECORATIVE BAND FOR CASSEROLE HOLDERS OR THE LIKE
Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 14, 1980, Ser. No. 149,679
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—39

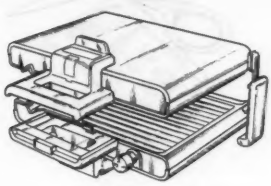
266,304
CREAM PITCHER
Walter Everhan, Klettenberg, Fed. Rep. of Germany, assignor to American Commercial, Incorporated, Gardena, Calif.
Filed Aug. 12, 1980, Ser. No. 177,414
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—66



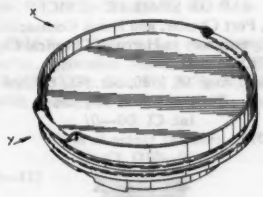
266,305
BEVERAGE CONTAINER INSULATOR
Stephen M. Scheurer, P.O. Drawer 539, Wichita Falls, Tex. 76307
Filed Aug. 14, 1979, Ser. No. 66,586
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—77

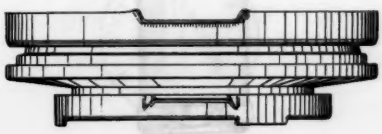


266,306
MEAT GRILL
Pierre Ansel, Vagney, France, assignor to SEB, Selongey, France
Filed Nov. 1, 1979, Ser. No. 90,448
Claims priority, application France, May 23, 1979, 79 160
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88

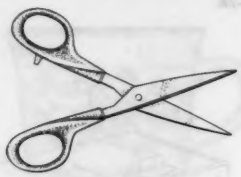


266,307
COOKING PAN UNIT
Yanta H. T. Lam, Kowloon, Hong Kong, assignor to Meyer Manufacturing Co. Ltd., Kowloon, Hong Kong
Filed May 10, 1979, Ser. No. 37,769
Claims priority, application United Kingdom, Apr. 4, 1979, 79 989358
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—94

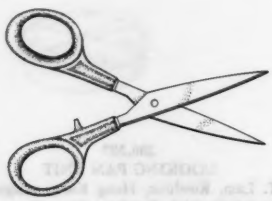




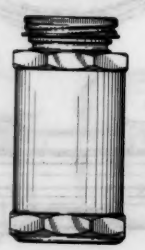
266,308
SCISSORS
Erkki O. Linden, Billnäs, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Feb. 29, 1980, Ser. No. 126,148
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



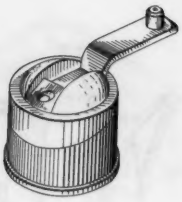
266,309
SCISSORS
Erkki O. Linden, Billnäs, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Feb. 29, 1980, Ser. No. 126,150
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



266,310
JAR OR SIMILAR ARTICLE
Jay W. Fidler, Port Chester, and Frank Cornacchuila, Bellport, both of N.Y., assignors to Hercules Chemical Company, Inc., New York, N.Y.
Filed Aug. 18, 1980, Ser. No. 179,304
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—392

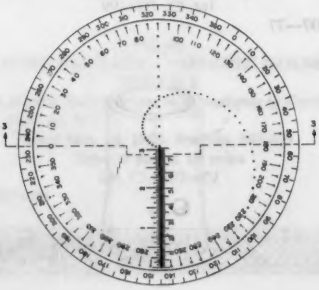


266,311
DISPENSING CAP FOR LIQUID CONTAINERS
Harley H. Mattheis, Verona, N.J., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Apr. 23, 1980, Ser. No. 143,158
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—446

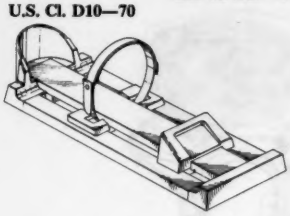


266,312
DIGITAL WATCH RING
Ellick Lin, 55-484, Taipei, Taiwan
Filed Jul. 22, 1980, Ser. No. 171,021
Term of patent 14 years
Int. Cl. D10—*02;* D11—*01*
U.S. Cl. D10—31

266,313
DRAFTING AND MEASURING TOOL
Jerrell F. Fulton, Crown King, Star Route, Mayer, Ariz. 86333
Filed Jun. 23, 1980, Ser. No. 162,193
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



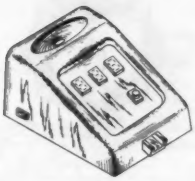
266,314
FOOTGAUGE
Nöel J. Haring, Woking, and Laurence A. Snook, Winchester, both of England, assignors to Clarks Limited, Somerset, England
Filed Aug. 11, 1980, Ser. No. 177,057
Claims priority, application United Kingdom, Mar. 19, 1980, 994114
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70



266,315
HYDROMETER
Ulf S. Tamm, 122 Ch. de la Montague, 1224 Chene Bougerics, Switzerland
Filed Aug. 12, 1980, Ser. No. 177,501
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—84

266,316
FLUID FLOW MEASURING HEAD
Zell Du Vall, St. Paul, Minn., assignor to TSI Incorporated, St. Paul, Minn.
Filed Oct. 27, 1980, Ser. No. 186,761
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

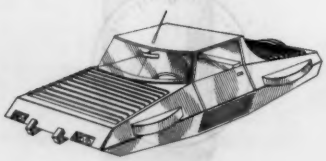
266,317
PILL COUNTER
William C. Dino, 62 Plantation St., and Stephen L. Johnson, 9 Beechmont St., both of Worcester, Mass. 01609
Filed Sep. 26, 1980, Ser. No. 190,929
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—97



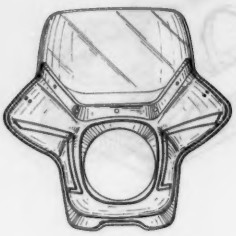
266,318
DIAL PLATE FOR A TIMEPIECE
Kiichi Noguchi, No. 2400, Ohyaguchi, Urawa-shi, Saitama-ken, Japan (336)
Filed Apr. 27, 1979, Ser. No. 33,786
Claims priority, application Japan, Dec. 18, 1978, 53/53268; Dec. 18, 1978, 53/53270; Dec. 25, 1978, 53/55037; Dec. 25, 1978, 53/55040; Dec. 25, 1978, 53/55041; Dec. 25, 1978, 53/55042
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—123

266,319
BADGE
Ernest Picheria, 108 Liberty St., Lodi, N.J. 07644
Filed Apr. 12, 1979, Ser. No. 29,176
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—56

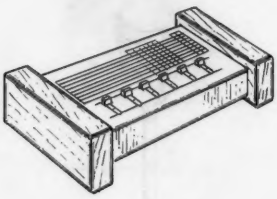
266,320
HOVER CRAFT
Elie P. Kfoury, 15, Mahmoud Bassiouni St., 2485 Cairo A.R.E., Egypt
Filed Sep. 7, 1979, Ser. No. 73,497
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5



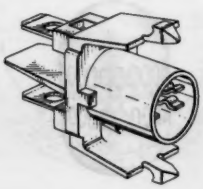
266,321
WINDSHIELD FOR MOTORCYCLE
Minoru Morioka, Kawagoe, and Hideki Sugihara, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.), Tokyo, Japan
Filed Aug. 2, 1979, Ser. No. 63,332
Claims priority, application Japan, Feb. 6, 1979, 54-42151
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



266,322
MASTER CONTROL FOR TELEVISION AND VIDEO RECORDER SYSTEM
Ted Easterling, 7738 Clairemont Mesa, San Diego, Calif. 92111
Filed Feb. 22, 1980, Ser. No. 123,914
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



266,323
MINIATURE LAMPHOLDER
David Partridge, West Wickham, England, assignor to Starpoint Electrics Limited, Surrey, England
Filed Mar. 24, 1980, Ser. No. 133,449
Claims priority, application United Kingdom, Oct. 1, 1979, 991791
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—25



266,324

LOUDSPEAKER

Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan

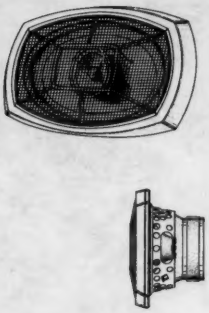
Filed Apr. 10, 1980, Ser. No. 139,143

Claims priority, application Japan, Feb. 5, 1979, 54-3894

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—30



266,325

TELEPHONE CONSOLE

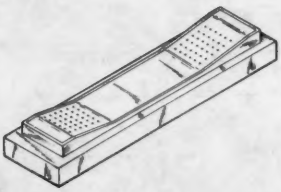
Joseph J. Butchko, P.O. Box G-747 - Station "G", Calgary, Alberta, Canada

Filed May 29, 1979, Ser. No. 43,390

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—63



266,326

AMPLIFIER FOR AUTOMOBILE

Toshiyoshi Kikuhara, Naka, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

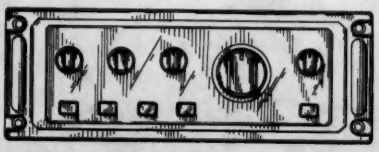
Filed Oct. 26, 1979, Ser. No. 88,624

Claims priority, application Japan, Apr. 26, 1979, 54-17299

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—96



266,327

AUTOMATIC INJECTION MOLDING MACHINE

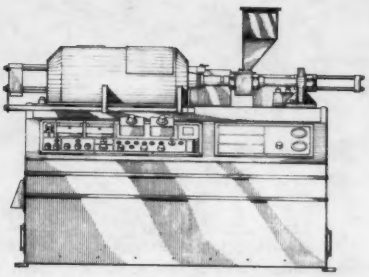
Marvin E. Haight, Fairfield, and William R. Jones, Cincinnati, both of Ohio, assignors to Micromolder Machinery, Inc., Cincinnati, Ohio

Filed Jul. 7, 1980, Ser. No. 166,351

Term of patent 14 years

Int. Cl.[3] D15—*09*

U.S. Cl. D15—135



266,328

COMBINATION SUPPORT AND CONTROL FOR A HEAT SHRINK ROLLER

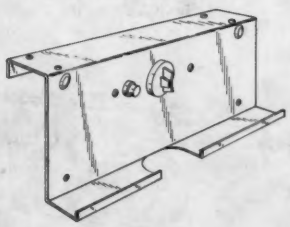
Shirley F. Fleshman, P.O. Box 75402, Oklahoma City, Okla. 73147

Filed May 18, 1979, Ser. No. 40,329

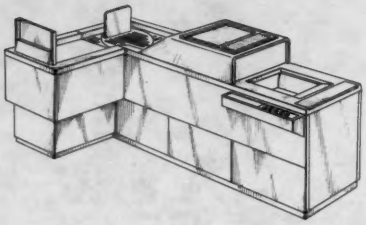
Term of patent 14 years

Int. Cl. D15—*99*

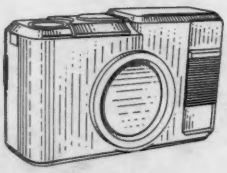
U.S. Cl. D15—144



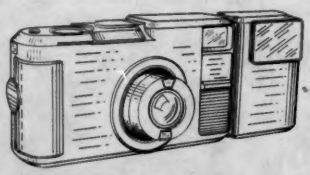
266,329
MERCHANDISE BAGGING MACHINE
Eiichi Tsujimoto, Kobe, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan
Filed Apr. 3, 1980, Ser. No. 137,002
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145



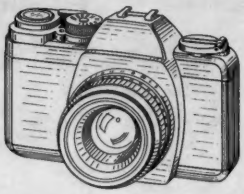
266,330
PHOTOGRAPHIC CAMERA
Herbert Schultes, Fürstenfeldbruck, and Karl-Heinz Rubner, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 175,191
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



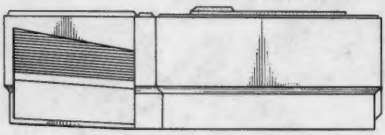
266,331
COMBINED CAMERA AND FLASH UNIT
Herbert Schultes, Fürstenfeldbruck, and Karl-Heinz Rubner, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 175,188
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6



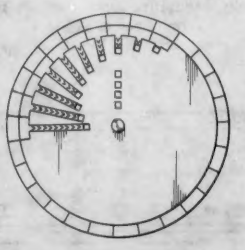
266,332
SINGLE LENS REFLEX CAMERA
Herbert Schultes, Fürstenfeldbruck, and Karl-Heinz Rubner, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 25, 1980, Ser. No. 172,430
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—8



266,333
COMBINED COPYING AND SORTING APPARATUS
Frederick J. Lawrence, 13372 Cindy La., Tustin, Calif. 92680
Filed May 7, 1980, Ser. No. 147,368
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



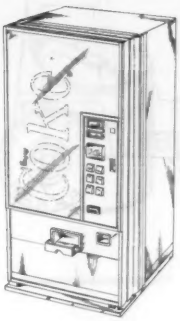
266,334
COMPUTER FOR BLACKJACK DECISIONS
Stephen M. Speers, 1 W. Armour Blvd., Kansas City, Mo. 64111
Filed Aug. 6, 1979, Ser. No. 64,200
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—10



266,335
COMBINED WRITING INSTRUMENT AND WATCH
Ho Sing Chau, Kowloon, Hong Kong, assignor to H & T Electronic Industries Ltd., Kowloon, Hong Kong
Filed Jul. 25, 1980, Ser. No. 173,267
Claims priority, application United Kingdom, Jan. 30, 1980, 993364
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

266,336
CARD FILE
William S. Leib, III, Newton, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.
Filed Aug. 25, 1980, Ser. No. 181,193
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

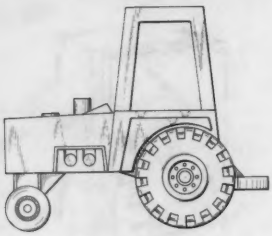
266,337
VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Feb. 20, 1981, Ser. No. 236,182
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—5



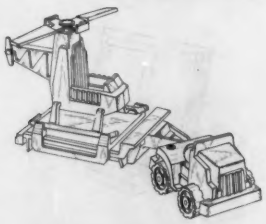
266,338
CARD HOLDER AND DISPLAY DEVICE
Charles S. Mandel, 25483 Ingleside, Southfield, Mich. 48034
Filed Jun. 23, 1980, Ser. No. 161,773
Term of patent 3½ years
Int. Cl. D20—*03;* D6—*07*
U.S. Cl. D20—43

266,339
PUZZLE
Dennis B. Dunstan, 9477 Lloyd Crest Dr., Beverly Hills, Calif. 90210
Filed May 11, 1981, Ser. No. 262,339
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104

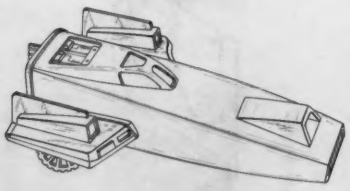
266,340
TOY TRACTOR
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1981, Ser. No. 228,776
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—132



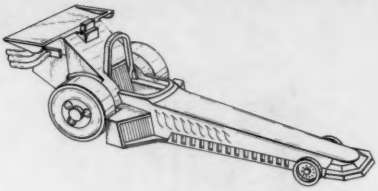
266,341
TOY HELICOPTER RIG
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 24, 1980, Ser. No. 219,945
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



266,342
TOY RACE CAR
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 15, 1980, Ser. No. 216,207
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137

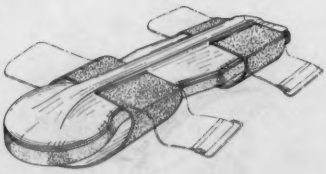


266,343
TOY DRAGSTER
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 15, 1980, Ser. No. 216,265
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137

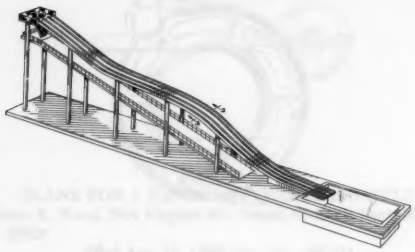


266,344
GOLF DRIVER HEAD
Clovis R. Duclos, 15463 Chemical La., Huntington Beach, Calif. 92649
Filed Apr. 10, 1980, Ser. No. 139,012
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214

266,345
GOLFING WRIST CONTROL ATTACHMENT OR THE LIKE
George F. Bigham, 1203 Berwick La., South Euclid, Ohio 44121, and Rodney B. Johnston, 4800 Dalebridge Rd., Warrensville Heights, Ohio 44128
Filed May 2, 1979, Ser. No. 35,250
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

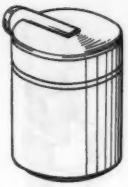


266,346
WATER SLIDE
George D. Millay, and Ronald D. Harper, both of San Diego, Calif., assignors to Wet 'N Wild, Inc., Orlando, Fla.
Filed Feb. 13, 1980, Ser. No. 121,121
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244

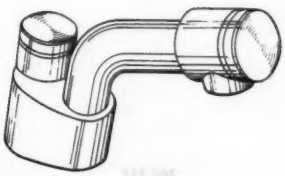


266,347
FAUCET FOR PROTECTING STERILE FLUID SYSTEMS
Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014
Filed May 19, 1980, Ser. No. 151,171
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—03

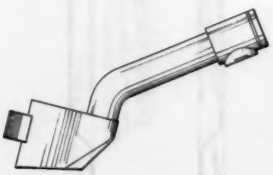
266,348
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Fabbrica Italiana Rubinetterie S.p.A., Cavaglio D'Agogna, Italy
Filed Mar. 4, 1981, Ser. No. 240,357
Claims priority, application Italy, Sep. 4, 1980, 22678 B/80
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



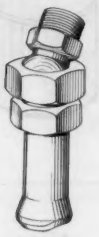
266,349
COMBINED SPOUT AND POP-UP DRAIN KNOB
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Fabbrica Italiana Rubinetterie S.p.A., Novara, Italy
Filed Mar. 4, 1981, Ser. No. 240,353
Claims priority, application Italy, Sep. 4, 1980, 22680 B/80
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



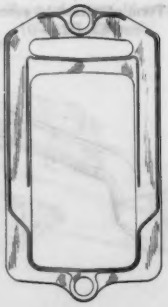
266,350
SPOUT
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Fabbrica Italiana Rubinetterie S.p.A., Cavaglio D'Agogna, Italy
Filed Mar. 4, 1981, Ser. No. 240,356
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



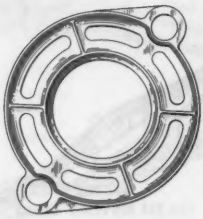
266,351
MULTIDIRECTIONAL WELDING OUTLET
Robert W. Schneider, Allentown; Alfred S. Gilly, Northampton; John R. Diamant, Nazareth, and James I. Dantzer, Center Valley, all of Pa., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.
Filed May 19, 1980, Ser. No. 151,026
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



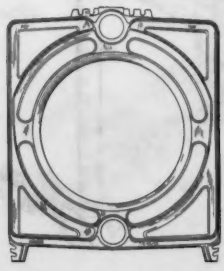
266,352
BOILER SECTION
Henning Rasmussen, Odense, Denmark, assignor to A/S Tasso Odense, Odense, Denmark
Filed Apr. 22, 1980, Ser. No. 142,723
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90



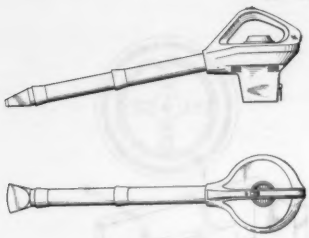
266,353
BOILER SECTION
Henning Rasmussen, Odense, Denmark, assignor to A/S Tasso Odense, Odense, Denmark
Filed Apr. 22, 1980, Ser. No. 142,724
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90



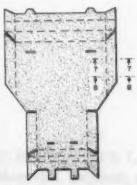
266,354
BOILER SECTION
Henning Rasmussen, Odense, Denmark, assignor to A/S Tasso Odense, Odense, Denmark
Filed Apr. 22, 1980, Ser. No. 142,725
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90



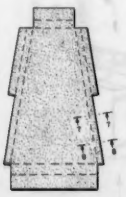
266,355
AIR BLOWER
James F. Mariol, Cincinnati, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 19, 1980, Ser. No. 151,348
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



266,356
BLANK FOR A COMBINED VENT AND BAFFLE
Bruce K. Ward, 2904 Virginia Ave. South, St. Louis Park, Minn. 55426
Filed Apr. 15, 1980, Ser. No. 140,671
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



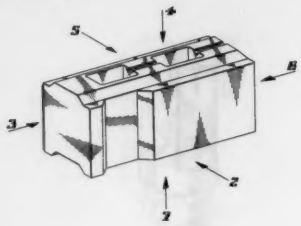
266,357
BLANK FOR A COMBINED VENT AND BAFFLE
Bruce K. Ward, 2904 Virginia Ave. South, St. Louis Park, Minn. 55426
Filed Apr. 28, 1980, Ser. No. 144,646
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



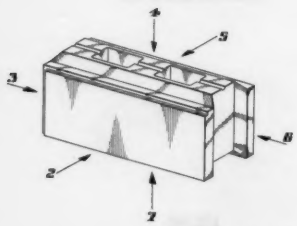
266,358
SAMPLE CUP
Ralph M. Kerns, Arlington, Tex., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 2, 1980, Ser. No. 155,285
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

266,359
CHANNEL MEMBER FOR OFFICE SPACE DIVIDING SYSTEM
Burton L. Siegal, Skokie, Ill., assignor to Acme Steel Door Corp., Brooklyn, N.Y.
Filed Sep. 30, 1980, Ser. No. 192,470
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

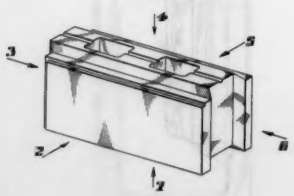
266,360
BUILDING BLOCK
Jose Coelho dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisbon, Portugal
Filed Sep. 17, 1980, Ser. No. 187,986
Claims priority, application Portugal, Mar. 25, 1980, 15050
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



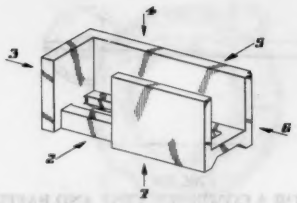
266,361
BUILDING BLOCK
Jose Coelho dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisbon, Portugal
Filed Sep. 17, 1980, Ser. No. 188,013
Claims priority, application Portugal, Mar. 25, 1980, 15048
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



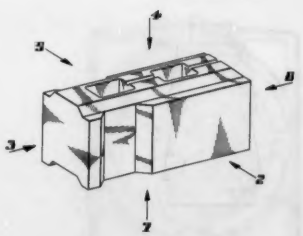
266,362
BUILDING BLOCK
Jose Coelho dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisbon, Portugal
Filed Sep. 17, 1980, Ser. No. 188,014
Claims priority, application Portugal, Mar. 25, 1980, 15045
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



266,363
BUILDING BLOCK
Jose Coelho dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisbon, Portugal
Filed Sep. 17, 1980, Ser. No. 188,015
Claims priority, application Portugal, Mar. 25, 1980, 15046
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



266,364
BUILDING BLOCK
Jose Coelho dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisbon, Portugal
Filed Sep. 17, 1980, Ser. No. 188,016
Claims priority, application Portugal, Mar. 25, 1980, 15047
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



266,365
CANDLE FLOAT OR THE LIKE
Robert A. Rosenbaum, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 24, 1980, Ser. No. 171,974
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—22

266,366
WELSH MINER'S LAMP
David S. Harper, Bishopston, England, assignor to Mayer Mill Mining and Trade Company, Washington, D.C.
Filed Sep. 10, 1979, Ser. No. 74,102
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—104

266,367
TRASH CART
Louis G. Marini, Mt. Laurel, and Thomas O. Marini, Marlton, both of N.J., assignors to Suntemp Industries, Inc., Blackwood, N.J.
Filed Mar. 24, 1980, Ser. No. 132,825
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24

266,368
LOG CART
Dudley K. Flanders, Fort Smith, Ark., assignor to Flanders Industries, Inc., Fort Smith, Ark.
Filed Mar. 19, 1981, Ser. No. 245,380
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—26

266,369
CONTEMPORARY ROSARY
Mary Corigliano, 139 Parsonage Hill Rd., Short Hills, N.J. 07078
Filed Aug. 8, 1980, Ser. No. 176,412
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—26

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I. Spindleless spinning machine. 4,351,149, Cl. 57-263.000.

Abe, Takaharu: *See*—
Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, 4,351,747, Cl. 252-511.000.

Abe, Takeshi: *See*—
Mizuta, Toshiaki; Abe, Takeshi; Yoshihara, Ichiro; and Saito, Kazuhito, 4,352,104, Cl. 340-825.150.

Abraham, Ooriapadical C.: *See*—
Owens, William R.; Chan, Henry C.; Abraham, Ooriapadical C.; and Parker, Levi C., 4,351,649, Cl. 55-162.000.

ACF Industries, Inc.: *See*—
McNairy, James A.; and Fitzgerald, John B., 4,351,151, Cl. 60-290.000.
Merten, Jeff L., 4,351,414, Cl. 184-105.00B.

Acker, William F., to Honeywell Inc. Intended value determination system. 4,352,193, Cl. 375-76.000.

Ackerman, Dean C.; and Smith, Don W., to Babcock & Wilcox Company, The. Oscillating soot blower mechanism. 4,351,082, Cl. 15-316.00R.

Acme Highway Products Corporation: *See*—
Kerschner, James J., 4,351,622, Cl. 404-64.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Minagawa, Motonubu, 4,351,915, Cl. 524-103.000.

Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, to Robert Bosch GmbH. Ignition coil with overvoltage protection connected to the secondary winding of the ignition coil. 4,351,310, Cl. 123-644.000.

Afanasiev, Vladimir K.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Agency of Industrial Science & Technology: *See*—
Muramatsu, Hiroshige; and Ueda, Teruo, 4,351,954, Cl. 562-574.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Kiessling, Werner; Wiedemann, Otto; Lau, Peter; and Vondrovsky, Gabriel, 4,351,497, Cl. 242-194.000.

Ahlschwede, Brian A., to Deere & Company. Wheel attaching device. 4,351,568, Cl. 301-36.00R.

Aiba, Makoto: *See*—
Ichikawa, Shigeo; Ito, Motonobu; and Aiba, Makoto, 4,351,175, Cl. 72-203.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,351,191, Cl. 73-728.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hattori, Takemi, 4,351,563, Cl. 297-408.000.
Kanou, Noboru; and Mori, Keiji, 4,351,560, Cl. 296-216.000.
Toyoda, Minoru, 4,351,173, Cl. 70-456.00R.

Aizawa, Hiroshi: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; and Watanabe, Yoshiaki, 4,351,597, Cl. 354-266.000.

Ajima, Takashi: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,351,894, Cl. 430-313.000.

Akebono Brake Industry Co., Ltd.: *See*—
Kurata, Masayuki; and Watanabe, Yushiyo, 4,351,421, Cl. 188-73.450.

Akisada, Masahide: *See*—
Fukushima, Osamu; Akisada, Masahide; Monma, Yoshiyuki; and Kitamura, Kazuaki, 4,352,198, Cl. 378-185.000.

Akita, Eiichi: *See*—
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.

Akita, Kin-ichiro: *See*—
Fukushima, Madoka; Akita, Kin-ichiro; and Masuda, Yoshihisa, 4,351,188, Cl. 73-189.000.

Aktiebolaget Electrolux: *See*—
Simonsson, Sven B., 4,351,083, Cl. 15-373.000.

Aktiebolaget IRO: *See*—
Lindstrom, Fred B.; and Bengtsson, Alf R. A., 4,351,495, Cl. 242-47.010.

Aktiengesellschaft Muhnle, Kopp & Kausch: *See*—
Richter, Helmuth, 4,351,154, Cl. 60-605.000.

Akzo N.V.: *See*—
Reesink, Johan B.; Hageman, Hendrik J.; and Wiersum, Ulfert E., 4,351,935, Cl. 528-242.000.

Albany International Corp.: *See*—
Sebring, Robert E.; and Coplan, Myron J., 4,351,092, Cl. 28-100.000.

Alexander, Glenn. Arm wrestling exerciser. 4,351,523, Cl. 272-67.000.

Alfa-Laval Inc.: *See*—
Riese, Hans M., 4,351,851, Cl. 426-524.000.

Alfa Romeo S.p.A.: *See*—
Rovetta, Alberto; Franchetti, Ilario; and Vicentini, Pietro, 4,351,553, Cl. 294-106.000.

Alford, Steven D. Remote control bench mounted chain saw apparatus. 4,351,209, Cl. 83-788.000.

Allbright, Forrest E., to NCR Corporation. Keyboard switch assembly. 4,351,988, Cl. 200-5.00A.

Allebach, Gene E., to National Machinery Company, The. Workpiece turning transfer. 4,351,180, Cl. 72-405.000.

Alleman, Raymond A.: *See*—
Rarig, Larry L.; Alleman, Raymond A.; and Miller, Dennis L., 4,351,263, Cl. 118-665.000.

Allen, Robert H., to University Patents, Inc. Quantitative testing for vitamin B_{12}. 4,351,822, Cl. 424-1.000.

Allen, Walter E., to Transamerica DeLaval, Inc. Fuel supply for a diesel engine. 4,351,301, Cl. 123-557.000.

Allis-Chalmers Corporation: *See*—
Hansen, Kenneth N., 4,351,198, Cl. 74-482.000.
Prince, George T.; and Ballendux, Gerardus M., 4,351,168, Cl. 464-64.000.
Worringer, Thomas J., 4,351,556, Cl. 296-63.000.

Alpine Aktiengesellschaft: *See*—
Hess, Viktor, 4,351,488, Cl. 241-224.000.

Alpine Kinetics, Inc.: *See*—
Turro, Nicholas J., 4,351,707, Cl. 204-158.00R.

Alps Electric Company, Ltd.: *See*—
Inoue, Akihiko; and Ito, Takeo, 4,351,995, Cl. 200-159.00A.
Kato, Masaki; and Tobita, Katsumi, 4,352,205, Cl. 455-183.000.
Ohkubo, Wataru, 4,352,203, Cl. 455-176.000.

Altenpohl, Paul J.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,351,087, Cl. 17-44.100.

Altenpohl, William F.; and Altenpohl, Paul J. Latch release system for poultry carriers. 4,351,087, Cl. 17-44.100.

Altland, Henry W.; and Shiao, Daniel D., to Eastman Kodak Company. Mesoionic silver halide stabilizer precursor and use in a heat developable and heat stabilizable photographic silver halide material and process. 4,351,896, Cl. 430-354.000.

Amann, Markus C. Semiconductor laser diode. 4,352,187, Cl. 372-46.000.

Amax Inc.: *See*—
Beckstead, Leo W.; Huggins, Dale K.; and Queneau, Paul B., 4,351,808, Cl. 423-61.000.
Ernst, Runyon G., deceased; Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., 4,351,705, Cl. 204-108.000.

Amazonen-Werke: *See*—
Dreyer, Heinz, 4,351,481, Cl. 239-670.000.

Ambler, Jeffrey, to Gelman Sciences, Inc. Electrophoresis method for detecting glycosylated hemoglobin in blood. 4,351,711, Cl. 204-180.00G.

Ament, Frank, to General Motors Corporation. Diesel fuel injection pump secondary fuel metering control system. 4,351,283, Cl. 123-458.000.

American Cyanamid Company: *See*—
Cesark, Frank F.; and Thomas, Daniel W., 4,351,956, Cl. 564-256.000.

American Enviro-Port, Inc.: *See*—
Mixon, James A., 4,351,722, Cl. 210-195.300.

American Hoechst Corporation: *See*—
Walls, John E., 4,351,895, Cl. 430-331.000.

American Home Products Corp.: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,351,942, Cl. 546-269.000.
Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., 4,351,828, Cl. 424-177.000.
Hurwitz, Arthur; Michelucci, John; and Krupey, John, 4,351,158, Cl. 62-60.000.
Rakhit, Sumanas; and Bagli, Jehan F., 4,351,832, Cl. 424-246.000.

American Radionic Co., Inc.: *See*—
Stockman, Robert M., 4,352,145, Cl. 361-329.000.

Ametek, Inc.: *See*—
Kauffman, Gilbert, 4,351,734, Cl. 210-748.000.

Amey, Guy C., to Foxboro Company, The. Temperature control system for chromatographs. 4,351,385, Cl. 165-61.000.

Amon, William F., Jr.: *See—*
Neidleman, Saul L.; Amon, William F., Jr.; and Geigert, John, 4,351,902, Cl. 435-137.000.

AMP Incorporated: *See—*
Folk, Kenneth F., 4,351,110, Cl. 29-749.000.

Ampex Corporation: *See—*
Lilley, Martin A., 4,352,121, Cl. 358-326.000.

AMS Industries, Inc.: *See—*
Rodolakis, Michael S., 4,351,539, Cl. 280-47.260.

Anderson, Albert G., to Du Pont de Nemours, E. I., and Company. Derivatives of aryl ketones as visible sensitizers of photopolymerizable compositions. 4,351,893, Cl. 430-281.000.

Anderson, Carl. Bending brake hemmer. 4,351,176, Cl. 72-322.000.

Anderson, David L.; and Joseph, A. David, to Sealed Power Corporation. Metal-to-plastic pipe joint. 4,351,550, Cl. 285-158.000.

Anderson, Forest L.; and Nation, Robert H. Waste heat recovery system for an internal combustion engine. 4,351,155, Cl. 60-618.000.

Anderson, Robert D. Diver's bottom timer/depth gauge or the like and direct digital input and tracking system therefor. 4,352,168, Cl. 368-10.000.

Andersson, Hans: *See—*
Farnstrom, Sven E.; and Andersson, Hans, 4,351,616, Cl. 374-209.000.

Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, to Electroplating Engineers of Japan, Limited. Apparatus dipping plating. 4,351,266, Cl. 118-425.000.

Andra, Wolfhart: *See—*
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; and Schlaich, Jorg, 4,352,112, Cl. 343-915.000.

Andrade, Robert M.: *See—*
Kordes, Arthur W.; Andrade, Robert M.; and Peterson, Roger W., 4,351,579, Cl. 339-14.00R.

Andreadakis, Nicholas C., to Burroughs Corporation. Display panel with anode and cathode electrodes located in slots of base plate. 4,352,040, Cl. 313-217.000.

Andrews, Gerald D.; and Sharkey, William H., to Du Pont de Nemours, E. I., and Company. ω-, and α,ω-Hydroxyhydrocarbyl-(alkyl methacrylate) polymers and process. 4,351,924, Cl. 525-330.600.

Andrien, Yves; and Triquet, Christian, to Usines a Cuivre et a Zinc de Liege. Method of making corrosion resistant phosphorous copper or phosphorous copper alloy pipes. 4,351,678, Cl. 148-6.310.

Angarov, Ernst I.: *See—*
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Angioletti, Attilio, to Industrie Pirelli S.p.A. Heat-insulated conduit. 4,351,366, Cl. 138-149.000.

Anshakov, Anatoly S.: *See—*
Zhukov, Mikhail F.; Lytkin, Albert Y.; Khudyakov, Georgy N.; and Anshakov, Anatoly S., 4,352,044, Cl. 315-111.210.

Antek Instruments GmbH: *See—*
Bartke, Rolf, 4,351,801, Cl. 422-78.000.

Anthony Manufacturing Corporation: *See—*
Choi, Mansam, 4,351,477, Cl. 239-205.000.

Anton Steinecker Maschinenfabrik GmbH: *See—*
Wolfseder, Alfons, 4,351,231, Cl. 99-277.200.

Antonov, Jury F.; Glebov, Igor A.; and Shakhtarin, Valentin N. Contactless superconducting synchronous electrical machine. 4,352,033, Cl. 310-52.000.

Aoki, Kozo; Seto, Nobuo; Yabuki, Yoshiharu; Morigaki, Masakazu; Furutachi, Nobuo; and Nakamura, Kotaro, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,351,897, Cl. 430-555.000.

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Hashimoto, Seiichi; and Aoki, Takaaki, 4,351,097, Cl. 29-229.000.

Aoyama, Hideki; and Kishida, Takashi, to Teijin Limited. Method for threading a yarn delivered from a godet roller on a bobbin and an apparatus for effecting the same. 4,351,492, Cl. 242-18.00R.

Applications Mecanique et Robinetterie Industrielle, A.M.R.I.: *See—*
Garrigues, Jean-Claude, 4,351,511, Cl. 251-174.000.

Arakawa, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Fluid supply apparatus in shuttleless loom. 4,351,369, Cl. 139-435.000.

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LLorente Agudo, Nieves; Elia Miguel, Maria F.; Aranguren Escobar, Maria A.; Pares Olivet, Eulalia; and Fernandez Garvajosa, Jose M., 4,351,903, Cl. 435-234.000.

Archibald, James B.: *See—*
Karhan, Barry L.; and Archibald, James B., 4,352,034, Cl. 310-59.000.

Argyle, Charles S.; and Nanos, Ralph G., to Borg-Warner Corporation. Retaining clips for gasketed tanks on heat exchangers. 4,351,390, Cl. 165-149.000.

Ariga, Nagao; Shimazu, Kyotaro; Takenaka, Hidenori; and Sato, Hiroyuki, to Dainippon Ink & Chemicals, Inc. Thermoplastic resin composition. 4,351,920, Cl. 525-67.000.

Ariki, Yusaku; Himo, Takio; and Yoshida, Noboru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for purifying 1,2-dichloroethane. 4,351,976, Cl. 570-262.000.

Arkens, Charles T., to Rohm and Haas Company. Heteropolymer acrylic latices and textiles treated therewith. 4,351,875, Cl. 428-290.000.

Armex AG: *See—*
Gander, Peter, 4,351,139, Cl. 52-378.000.

Armitage, John B., to Du Pont de Nemours, E. I., and Company. Polyethylene copolymers. 4,351,931, Cl. 526-227.000.

Armstrong World Industries, Inc.: *See—*
Tymon, Thomas M., 4,351,641, Cl. 8-638.000.

Arnaud, Gaston, to Societe Industrielle de Brevets et d'Etudes SIBE. Processes and devices for automatic control to ignition advance. 4,351,280, Cl. 123-415.000.

Arnold, Peter: *See—*
Hunold, Klaus; Reinmuth, Klaus; Lipp, Alfred; Napholcz, Johannes; and Arnold, Peter, 4,351,858, Cl. 427-193.000.

Arnoldt, Peter J., to Ductmate Industries, Inc. Method for positioning and securing components of a workpiece. 4,352,003, Cl. 219-103.000.

Aro Corporation, The: *See—*
Brandenberg, Karl A.; and Kautz, Wilbert G., 4,351,225, Cl. 91-50.000.

Artaud, Robert; Aubert, Michel; and Renaux, Charley, to Commissariat a l'Energie Atomique. Fast neutron reactor. 4,351,794, Cl. 376-404.000.

Arthur D. Little, Inc.: *See—*
Sidman, Kenneth R., 4,351,337, Cl. 128-260.000.

ASA S.A.: *See—*
Faure, Jean-Louis; and Vanhelle, Michel, 4,351,146, Cl. 57-6.000.

Asahi Chemical Industry Co., Ltd.: *See—*
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,351,947, Cl. 548-251.000.

Asahi Engineering Co. Ltd.: *See—*
Shindome, Mamoru; Yanagita, Takanori; Nakamura, Takanori; and Otsuji, Hiroyuki, 4,351,252, Cl. 110-346.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yoshida, goichi; Hayano, Fusakazu; and Ii, Yoshiro, 4,351,860, Cl. 427-246.000.

Asano, Kazuhiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,352,169, Cl. 368-73.000.

Aschwanden, Felix, to RCA Corporation. Comparison arrangement for a digital tuning system. 4,352,206, Cl. 455-184.000.

Asea Aktiebolag: *See—*
Axelsson, Bror; Johnsen, Ulf; Stenstrom, Lennart; and Thors, Bengt, 4,352,140, Cl. 361-127.000.
Ericksson, Leif, 4,352,136, Cl. 361-80.000.

Assard, Gerald L., to United States of America, Navy. A/D Dynamic range enhancing technique. 4,352,095, Cl. 340-347.0DD.

Atlantic Richfield Company: *See—*
Styring, Ralph E., Jr., 4,351,655, Cl. 62-28.000.

Au, Lonnie C.: *See—*
Frech, John W.; and Au, Lonnie C., 4,352,160, Cl. 364-553.000.

Aubert, Michel: *See—*
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,351,794, Cl. 376-404.000.

Augat Inc.: *See—*
Kirkman, Michael; Rydwansky, Frank C., Jr.; Hanlon, Richard J.; and Petersen, Richard W., 4,351,580, Cl. 339-17.0CF.

Auracher, Franz: *See—*
Winzer, Gerhard; and Auracher, Franz, 4,351,585, Cl. 350-96.150.

Austria Email Aktiengesellschaft: *See—*
Hartmann, Ferdinand, 4,351,859, Cl. 427-232.000.

Auto-Valve, Inc.: *See—*
Koller, Floyd G.; and Drew, Ralph H., Jr., 4,351,355, Cl. 137-329.060.

Automatic Solar Covers, Inc.: *See—*
Smith, Marc, 4,351,072, Cl. 4-503.000.

Automotive Products Limited: *See—*
Young, Alastair J., 4,351,570, Cl. 303-24.00F.

Axelsson, Bror; Johnsen, Ulf; Stenstrom, Lennart; and Thors, Bengt, to Asea Aktiebolag. Surge arrester. 4,352,140, Cl. 361-127.000.

Axton, Hoyt W. Survival stick. 4,351,348, Cl. 135-66.000.

Aylott, John, to WIPAC Development Limited. Coil assembly for an ignition system. 4,351,286, Cl. 123-601.000.

Azzolini, Georges P., to Sovra S.A. Method and apparatus for cutting blanks from foam material. 4,351,211, Cl. 83-861.000.

B.A.T. Cigaretten-Fabriken GmbH: *See—*
Brummer, Ursula; and Heeman, Volker, 4,351,346, Cl. 131-276.000.

B. F. Goodrich Company, The: *See—*
Sidles, James; and Blayne, Jerome J., 4,351,789, Cl. 264-130.000.

Baasner, Bernd; Klauke, Erich; and Kysela, Ernst, to Bayer Aktiengesellschaft. Preparation of 3-bromo-4-fluorotoluene. 4,351,974, Cl. 570-174.000.

Babbage, Thomas A., to Trianco Redfyre Limited. Boilers. 4,351,315, Cl. 126-73.000.

Babcock-Hitachi Kabushiki-Kaisha: *See—*
Matsuda, Shinpei; Kato, Akira; Uno, Shigeo; Sakuta, Youichi; and Nakajima, Fumito, 4,351,811, Cl. 423-239.000.
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.

Babcock & Wilcox Company, The: *See—*
Ackerman, Dean C.; and Smith, Don W., 4,351,082, Cl. 15-316.00R.

Baer, James W.: *See—*
Kuppenheimer, John D., Jr.; and Baer, James W., 4,352,186, Cl. 372-41.000.

Bagley, Julius B.: *See—*
Titus, Theodore, IV; and Bagley, Julius B., 4,352,173, Cl. 369-27.000.

Bagli, Jehan F.: *See—*
Rakhit, Sumanas; and Bagli, Jehan F., 4,351,832, Cl. 424-246.000.

Bahl, Chander P., to Cetus Corporation. Method for single nucleotide alteration. 4,351,901, Cl. 435-91.000.

Bahr, Theodor: *See*—
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

Bailes, Clyde E. Water treating apparatus. 4,351,720, Cl. 210-101.000.

Bailey, Martin; Hines, David A.; Ousby, John C.; and Roesler, Frank C., to Imperial Chemical Industries Limited. Treatment of biologically-degradable waste. 4,351,730, Cl. 210-629.000.

Baizer, Manuel M.; and Goodin, Richard D., to Monsanto Company. Process for making glyoxylate hemiacetals. 4,351,951, Cl. 560-186.000.

Baker, Robert G.; and Ramazzotti, Dario J., to Nordson Corporation. Hot melt multi-section hose heating system. 4,352,007, Cl. 219-301.000.

Baldwin, John L. E., to Independent Broadcasting Authority. Digital recording apparatus. 4,352,129, Cl. 360-32.000.

Ball Corporation: *See*—
Marcantonio, Arnold F.; Kress, Paul J.; and Powers, John W., 4,351,883, Cl. 428-450.000.
Wood, Charles L., 4,351,663, Cl. 65-66.000.

Ballendux, Gerardus M.: *See*—
Prince, George T.; and Ballendux, Gerardus M., 4,351,168, Cl. 464-64.000.

Balliutyn, Nicolaas J.; and Michno, Michael J., Jr., to Union Carbide Corporation. Prosthetic devices having sintered thermoplastic coatings with a porosity gradient. 4,351,069, Cl. 3-1.912.

Ballocci, Giovanni; and Brollo, Aurelio, to Industrie Pirelli S.p.A. Conveyor belt. 4,351,432, Cl. 198-847.000.

Balmar Crimp Tool Corp.: *See*—
Kelly, William D.; and Vella, Gregory J., 4,351,109, Cl. 29-747.000.

Baltek Corporation: *See*—
Kohn, Jean, 4,351,680, Cl. 156-79.000.

Bansal, Bihari, to Corning Glass Works. Furnace delivery system. 4,351,664, Cl. 65-128.000.

Barber, Donald J.; and Meaden, Douglas G., to Molins PLC. Cigarette packets. 4,351,433, Cl. 206-264.000.

Barber, Ronald A. File and jacket construction method and apparatus. 4,351,624, Cl. 405-228.000.

Bardens, William H.; and Nelson, Gale C., to Beckman Instruments, Inc. Electrical device and method for particle entrapment device for an electrical component. 4,352,119, Cl. 357-78.000.

Bardett, Allen R.: *See*—
Costamagna, Robert M.; Mori, Denis W.; and Bardett, Allen R., 4,351,850, Cl. 426-302.000.

Barmag Barmer Maschinenfabrik: *See*—
Schippers, Heinz; Munnekehoff, Gerd; and Teich, Udo, 4,351,494, Cl. 242-35.50A.

Barmore, Donald L.: *See*—
Cobleigh, Wendall C.; and Barmore, Donald L., 4,351,208, Cl. 83-167.000.

Barnett, William E., to Riker Laboratories, Inc. Anticoagulant substance. 4,351,938, Cl. 536-21.000.

Barry, Leon G.; and Rieman, Willis E., to Fasco Industries, Inc. Thermal fuse. 4,352,082, Cl. 337-409.000.

Bartels, Franklin D. Work gloves with attachment mechanism. 4,351,067, Cl. 2-160.000.

Bartels, Harold U.: *See*—
Ellestad, Raymond A.; and Bartels, Harold U., 4,351,329, Cl. 128-204.210.

Bartke, Rolf, to Antek Instruments GmbH. Combustion apparatus for use in elementary analysis. 4,351,801, Cl. 422-78.000.

BASF Wyandotte Corporation: *See*—
Kaneko, Thomas M., 4,351,753, Cl. 252-357.000.

Bass, Steven C., to Kimball International, Inc. Digital tone generation system utilizing fixed duration time functions. 4,351,219, Cl. 84-1.210.

Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, to Centro Ricerche Fiat S.p.A. Fuel injection method. 4,351,295, Cl. 123-300.000.

Battigelli, Jean A.: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Battigelli, Jean A.; and Plantard, Dominique, 4,351,661, Cl. 65-5.000.

Bauer, Edmund G., to Bethlehem Steel Corporation. Method of controlling a coking cycle. 4,351,701, Cl. 201-1.000.

Bauer, Herbert; and Weik, Guenter, to INOVAN - Stroebe G.m.b.H. and Co. KG. Method of producing a profile strip. 4,351,174, Cl. 72-47.000.

Bauermeister, Klaus; Ziemek, Gerhard; and Eilhardt, Bernd, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Thermally insulated tube. 4,351,365, Cl. 138-149.000.

Baumberger, Otto: *See*—
Kalbskopf, Reinhard; and Baumberger, Otto, 4,351,267, Cl. 118-718.000.

Baumgartner, Peter; Karlen, Urs; and Keller, Urs, to Ciba-Geigy AG. Process for the production of methoxyanthraquinones. 4,351,774, Cl. 260-383.000.

Baxt Industries, Inc.: *See*—
Enyart, Charles E.; and Shoulis, John E., 4,351,137, Cl. 52-202.000.

Bayer Aktiengesellschaft: *See*—
Baasner, Bernd; Klauke, Erich; and Kysela, Ernst, 4,351,974, Cl. 570-174.000.
Materne, Carsten, 4,351,837, Cl. 424-266.000.
Steinberger, Helmut; Moretto, Hans-Heinrich; Kortmann, Wilfried; and Pfeiffer, Josef, 4,351,736, Cl. 252-8.600.

Baylis, Michael A.; Harris, Peter; and Massey, Stewart R., to British-American Tobacco Co., Ltd. Headspace-sampling apparatus. 4,351,802, Cl. 422-89.000.

Bazell, Seymour: *See*—
Goldberg, Edward M.; and Bazell, Seymour, 4,351,341, Cl. 128-348.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Germann, Willy, 4,351,107, Cl. 29-736.000.

Beales, Keith J.; Day, Clive R.; and Newns, George R., to Post Office, The. Method for manufacture of graded index optical fibres. 4,351,659, Cl. 65-3.130.

Bear Medical Systems, Inc.: *See*—
Ellestad, Raymond A.; and Bartels, Harold U., 4,351,329, Cl. 128-204.210.

Beatrice Foods Co.: *See*—
Kaelblein, Robert; and Jones, John H., 4,351,474, Cl. 229-68.00R.

Beauducel, Claude; and Cretin, Jacques, to Institut Francais du Petrole; and Compagnie Generale de Geophysique. Sample-and-hold unit. 4,352,070, Cl. 328-151.000.

Beck, Heinz: *See*—
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

Becker, Erwin W.; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Method for producing separating nozzle elements. 4,351,653, Cl. 55-394.000.

Beckley, Don A.: *See*—
Street, Sidney W.; and Beckley, Don A., 4,351,932, Cl. 526-262.000.

Beckman Instruments, Inc.: *See*—
Bardens, William H.; and Nelson, Gale C., 4,352,119, Cl. 357-78.000.

Beckstead, Leo W.; Huggins, Dale K.; and Queneau, Paul B., to Amax Inc. Autoclave soda digestion of scheelite concentrates. 4,351,808, Cl. 423-61.000.

Bedis, Michael; and Westemeier, Donald E., to Deere & Company. Split master link for track of track-laying tractors. 4,351,573, Cl. 305-54.000.

Beesley, Graham E., to Motorola, Inc. Pulse detectors. 4,352,030, Cl. 307-350.000.

Beisel, Hermann; and Kraft, Hermann, to Heidelberger Druckmaschinen Aktiengesellschaft. Combined dampening-inking unit for offset printing machines. 4,351,236, Cl. 101-148.000.

Belin, Juliette. Ring. 4,351,166, Cl. 63-15.000.

Bell & Howell Company: *See*—
Kline, Donald D., 4,352,124, Cl. 358-60.000.
Oxman, Martin H., 4,352,200, Cl. 455-41.000.

Bellhouse, Brian J.; and Bellhouse, Francis H. Transfer membrane assembly. 4,351,797, Cl. 422-48.000.

Bellhouse, Francis H.: *See*—
Bellhouse, Brian J.; and Bellhouse, Francis H., 4,351,797, Cl. 422-48.000.

Bellicardi, Francesco; Dall'Osso, Carlo; and Cavallari, Bruno, to Weber S.p.A. Cold-engine starting and operating devices for carburetors. 4,351,782, Cl. 261-39.00A.

Bellus, Daniel: *See*—
Martin, Pierre; Steiner, Eginhard; and Bellus, Daniel, 4,351,961, Cl. 568-381.000.

Belokur, Nikolai A.: *See*—
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.

Belote, Stephen N.: *See*—
McCollum, Anthony W.; Edmonson, William L.; and Belote, Stephen N., 4,351,927, Cl. 525-437.000.

Belttary, Harold E., to GTE Products Corporation. Electrical terminal. 4,351,583, Cl. 339-259.00R.

Bendix Corporation, The: *See*—
Orme, Myrl E., 4,351,357, Cl. 137-446.000.

Benedek, George B.: *See*—
Clark, John I.; Mengel, Loretta S.; and Benedek, George B., 4,351,826, Cl. 424-81.000.

Benenati, Salvatore. Comminuting powered lawn mower. 4,351,144, Cl. 56-295.000.

Benerito, Ruth R.: *See*—
Ward, Truman L.; and Benerito, Ruth R., 4,351,857, Cl. 427-40.000.

Bengtsson, Alf R. A.: *See*—
Lindstrom, Fred B.; and Bengtsson, Alf R. A., 4,351,495, Cl. 242-47.010.

Bennett, Donald G. Combustion fuel and air flow control and mixer apparatus. 4,351,783, Cl. 261-44.00E.

Bergwerksverband GmbH: *See*—
Romey, Ingo; and Trojan, Willi, 4,351,739, Cl. 252-62.000.

Berkenblit, Melvin: *See*—
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Berner, Godwin; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Photochemically or thermally polymerizable mixtures. 4,351,708, Cl. 204-159.230.

Berta, Sophia. Spring assisted roller skates. 4,351,538, Cl. 280-11.260.

Bertozzi, Albert. Plastic bowling pin. 4,351,530, Cl. 273-82.00R.

Bethlehem Steel Corporation: *See*—
Bauer, Edmund G., 4,351,701, Cl. 201-1.000.

Bhojwani, Arju H.; Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corp. Solids quench boiler and process. 4,351,275, Cl. 122-7.00R.

Biedell, Edward L.; and Ferb, Robert J., to Research-Cottrell, Inc. Sulfur dioxide scrubber with hydroclone separator. 4,351,804, Cl. 422-170.000

Bielomatik Leuze GmbH + Co.: *See*—
Mann, Friedrich; and Negro, Guido, 4,351,371, Cl. 140-92.300.

Bier, Wilhelm: *See*—
Becker, Erwin W.; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,351,653, Cl. 55-394.000.

Bijlenga, Gosse, to Gist-Brocades N.V. Novel polyvalent virus vaccine. 4,351,827, Cl. 424-89.000.

Billenstein, Siegfried; May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Fabric softener concentrate. 4,351,737, Cl. 252-8.800.

Billi, Roberto; and Scagliola, Carlo, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and device for testing the quality of digital speech-transmission equipment. 4,352,182, Cl. 371-22.000.

Bindra, Jasjit S.: *See*—
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,351,940, Cl. 544-293.000.

Bio-Med Devices, Inc.: *See*—
Stenzler, Alex, 4,351,344, Cl. 128-720.000.

Biochemical Diagnostics, Inc.: *See*—
Kopp, Reiner H.; and Panetz, Allen I., 4,351,800, Cl. 422-70.000.

BioResearch, Inc.: *See*—
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,351,762, Cl. 260-112.50R.

Birr, Christian, to der Wissenschaften e.V. Max-Planck-Gesellschaft zur/Forderung. Process for the selective formation of disulfide bridges in polypeptides and therapeutic compositions. 4,351,764, Cl. 260-112.700.

Bishop, David C.; and Heywood, Alan E., to Johnson, Matthey & Co., Limited. Foldable metallic gauze pack and segment. 4,351,887, Cl. 428-594.000.

BJ-Hughes Inc.: *See*—
Scott, Floyd L., Jr., 4,351,116, Cl. 33-307.000.

Black & Decker Inc.: *See*—
Lessig, William R., III, 4,351,143, Cl. 56-17.500.

Blackmon, Lawrence E.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, to Fiber Industries, Inc. Spun-like yarn. 4,351,147, Cl. 57-208.000.

Blair, Albert; and Grant, Patrick T., to National Research Development Corporation. Rotatable fish cage. 4,351,268, Cl. 119-3.000.

Blair, Gilbert: *See*—
Fenton, Edward A., Jr.; Lakin, Ira W.; and Blair, Gilbert, 4,351,431, Cl. 198-823.000.

Blake, Arthur E.: *See*—
Middleman, Lee M.; Evans, Joseph H.; Blake, Arthur E.; and Scheff, Victor A., 4,352,083, Cl. 338-23.000.

Blatchford, Brian G., to Chas. A. Blatchford & Sons Limited. Artificial leg with stabilized knee mechanism. 4,351,070, Cl. 3-27.000.

Blatter, Kenneth F., to Dresser Industries, Inc. Terraced water distributor for evaporative air conditioner. 4,351,781, Cl. 261-29.000.

Blayne, Jerome J.: *See*—
Sidles, James; and Blayne, Jerome J., 4,351,789, Cl. 264-130.000.

Blinchikoff, Herman J.; and Vaughan, George R., to Westinghouse Electric Corp. Phase-locked loop filter. 4,352,074, Cl. 331-17.000.

Blount, David H. Process for the production of polyester silicate resinous products. 4,351,919, Cl. 524-858.000.

Bodai, Balaza I., to Sontek Industries, Inc. Simultaneous respiration and endotracheal suctioning of a critically ill patient. 4,351,328, Cl. 128-202.160.

Boeing Company, The: *See*—
Olson, Glenn O., 4,352,142, Cl. 361-218.000.
Peash, Douglas E.; and Yorozu, Arthur S., 4,351,501, Cl. 244-129.100.
Statkus, Frank D., 4,351,502, Cl. 244-219.000.

Bohanan, Roy E.: *See*—
Keehner, James E.; Linn, Samuel A.; Kahut, Marvin L.; Forrester, Bobby G.; and Bohanan, Roy E., 4,351,234, Cl. 101-10.000.

Boljevic, Jean M.: *See*—
Dautremay, Alain; and Boljevic, Jean M., 4,352,195, Cl. 375-120.000.
Perez, Andre; Boljevic, Jean M.; and Dautremay, Alain, 4,352,192, Cl. 375-56.000.

Bonavent, Gerard; and Montabord, Lucien, to Institut Francais du Petrole. Elements sensitive to certain polluting agents, particularly hydrocarbons and method of use. 4,351,642, Cl. 23-230.00M.

Bond, Curtis J., to Liqui-Box Corporation. Finger-actuated slideable dispensing valve. 4,351,455, Cl. 222-153.000.

Bonn, Jerrold L.: *See*—
Mahoney, Paul F.; and Bonn, Jerrold L., 4,352,029, Cl. 307-317.00R.

Bopp, Warren G., to Eaton Corporation. Dual stage control for viscous fluid coupling. 4,351,425, Cl. 192-58.00B.

Bopp, Warren G., to Eaton Corporation. Single stage control for viscous fluid coupling. 4,351,426, Cl. 192-58.00B.

Borg-Warner Corporation: *See*—
Argyle, Charles S.; and Nanos, Ralph G., 4,351,390, Cl. 165-149.000.
Kountz, Kenneth J.; and Erth, Richard A., 4,351,160, Cl. 62-201.000.
Ross, Louis, 4,351,204, Cl. 74-804.000.

Borowski, Edward: *See*—
Stefanska, Barbara J.; Falkowski, Leonard S.; and Borowski, Edward, 4,351,937, Cl. 536-6.400.

Bottger, Ernst: *See*—
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

Bouchard, Edgar, to Bouchard, Normand. Protective garment for the user of a chain saw. 4,351,065, Cl. 2-23.000.

Bouchard, Normand: *See*—
Bouchard, Edgar, 4,351,065, Cl. 2-23.000.

Boudot, Bernard; Grosbois, Jean; and Pajot, Michel, to Rhone-Poulenc Industries. Preparation of gallium oxide. 4,351,821, Cl. 423-624.000.

Boudot, Jean E.; Mazeau, Jean P.; and Michaud, Andre C., to Corning Glass Works. Ophthalmic glasses with high indices of refraction. 4,351,906, Cl. 501-74.000.

Bourdon, Jacques, to Rhone-Poulenc Industries. Preparation of chlorophenols. 4,351,969, Cl. 568-774.000.

Bourne, Richard G.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; Rozzo, Nancy A.; and Bourne, Richard G., 4,351,735, Cl. 252-1.000.

Boyd, Douglas P.; Herrmannsfeldt, William B.; Quinn, James R.; and Sparks, Robert A., to University of California, The Regents of the. X-Ray transmission scanning system and method and electron beam X-ray scan tube for use therewith. 4,352,021, Cl. 378-12.000.

Boyer, Lyndon D.: *See*—
Newman, Bruce A.; and Boyer, Lyndon D., 4,351,702, Cl. 201-5.000.

Braak, Dirk J., to Te Ka De Felton & Guilleaume Fernmeldeanlagen GmbH. Method for siting cosine-squared antennas and antenna array obtained thereby. 4,352,110, Cl. 343-844.000.

Bradshaw, Cyril E., to Eaton Corporation. Exhaust gas recycling modulator valve assembly. 4,351,285, Cl. 123-568.000.

Brady, Allan O. Battery cell assembly system and method. 4,351,106, Cl. 29-730.000.

Brandenberg, Karl A.; and Kautz, Wilbert G., to Aro Corporation, The. Vibration attenuation construction for an impact air tool. 4,351,225, Cl. 91-50.000.

Brandli, Hansheinrich: *See*—
Christen, Peter; Brandli, Hansheinrich; Durrer, Bernhard; and Sauerbrey, Arnim, 4,352,099, Cl. 340-633.000.

Brashears, David F., to Mechtron International Corp. Combustion apparatus. 4,351,251, Cl. 110-261.000.

Brems, John H.; and Graham, James T., to F. Jos. Lamb Company, a part interest. Workpiece storage system. 4,351,241, Cl. 104-93.000.

Brent, Albert: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.

Brett Enterprises, Inc.: *See*—
Brettler, David H., 4,351,302, Cl. 123-566.000.

Bretthauer, Hans J.: *See*—
Focke, Heinz H.; Liedtke, Kurt; and Bretthauer, Hans J., 4,351,142, Cl. 53-575.000.

Brettler, David H., to Brett Enterprises, Inc. Method and apparatus for reducing automotive pollution. 4,351,302, Cl. 123-566.000.

Brickner, Laurence R.; Moutner, David N.; and Pratt, Barbara J., to Sea-Land Service, Inc. Self-venting cargo container. 4,351,230, Cl. 98-31.000.

Brine, William H., Jr.: *See*—
Duplin, Joseph R., 4,351,528, Cl. 273-67.00A.

Bringhurst, Edward D., to Mannesmann Tally Corporation. Dot printing mechanism for dot matrix line printers. 4,351,235, Cl. 101-93.040.

Bristol-Myers Company: *See*—
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,351,766, Cl. 260-239.100.

British Aerospace Public Limited Company: *See*—
Swadling, Sidney J.; Mansbridge, Martin H.; Payne, Dennis J.; and Norton, John, 4,351,470, Cl. 228-157.000.

British-American Tobacco Co., Ltd.: *See*—
Baylis, Michael A.; Harris, Peter; and Massey, Stewart R., 4,351,802, Cl. 422-89.000.

British Nuclear Fuels Limited: *See*—
Nicholson, Graham, 4,351,795, Cl. 376-442.000.

British Steel Corporation: *See*—
Garner, Henry C.; and Broadbent, Jack, 4,351,184, Cl. 73-104.000.

Britton, Charles W. Reading of marks. 4,352,022, Cl. 250-561.000.

Brixius, Darryl W.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Isocyanate-functional polymers containing a terminal monosulfide group. 4,351,755, Cl. 524-555.000.

Broadbent, Jack: *See*—
Garner, Henry C.; and Broadbent, Jack, 4,351,184, Cl. 73-104.000.

Brogger, Fredric D. Device for removing foreign particles from a source of fluid. 4,351,727, Cl. 210-411.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Two-phase process for the preparation of azole and azoline disulfides. 4,351,945, Cl. 548-130.000.

Brollo, Aurelio: *See*—
Ballocci, Giovanni; and Brollo, Aurelio, 4,351,432, Cl. 198-847.000.

Bromme, Hermann: *See*—
Krebs, Waldemar; and Bromme, Hermann, 4,351,654, Cl. 62-13.000.

Bronkhorst, Arie J., to Buhrmann, David L. Therapeutic walking device. 4,351,324, Cl. 128-80.00J.

Brooks, David L., II, to Burroughs Corporation. Security document and method for making same using an alternating dot pattern. 4,351,547, Cl. 283-8.00R.

Brosseau, Janet V.; and Brosseau, Jon A., to Lowhurst, Harvey G. Unidirectional stretch mesh laminate and method. 4,351,872, Cl. 428-198.000.

Brosseau, Jon A.: *See*—
Brosseau, Janet V.; and Brosseau, Jon A., 4,351,872, Cl. 428-198.000.

Brouwer, Cornelis, to Rotaque (Proprietary) Limited. Pivoted railway hopper car door latch. 4,351,243, Cl. 105-241.200.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Stritt, Helmut; Schmidt, Alfred; and Leible, Erwin, 4,351,620, Cl. 403-13.000.

Brown, Jack, to Singer Company, The. Sewing machine needle positioning. 4,351,254, Cl. 112-158.00E.

Brown, Louis S., Jr., to Seaward International, Inc. Marine fender. 4,351,257, Cl. 114-219.000.

Brown, Paul C., to Convey, Inc. Player for digitally recorded music. 4,351,213, Cl. 84-1.010.

Brown & Williamson Tobacco Corporation: *See*—
Sexstone, John H.; Lewis, Tom; and Milliner, Ken, 4,351,792, Cl. 264-293.000.

Bruce, Ingrid: *See*—
Garpendahl, Gunnar; Bruce, Ingrid; and Lundmark, Ebbe, 4,352,060, Cl. 324-61.00R.

Brucker, Rainer: *See*—
Sommer, August; Heitmann, Wilhelm; and Brucker, Rainer, 4,351,970, Cl. 568-895.000.

Brummer, Ursula; and Heeman, Volker, to B.A.T. Cigaretten-Fabriken GmbH. Process for the preparation of aromatic substances. 4,351,346, Cl. 131-276.000.

Brunelle, Daniel J., to General Electric Company. Method for removing polyhalogenated hydrocarbons from nonpolar organic solvent solutions. 4,351,718, Cl. 208-262.000.

Bruns, Klaus: *See*—
Upadek, Horst; and Bruns, Klaus, 4,351,772, Cl. 549-331.000.

Bryant, Spencer L.: *See*—
Glorfield, Paul H.; Bryant, Spencer L.; and Kirklin, Vance L., 4,351,141, Cl. 53-473.000.

Buck, Kerry O.: *See*—
Emerson, James A.; Ramsey, James M.; and Buck, Kerry O., 4,351,582, Cl. 339-97.00R.

Bucking, Hans-Walter: *See*—
Billenstein, Siegfried; May, Adolf; and Bucking, Hans-Walter, 4,351,737, Cl. 252-8.800.

Buddemeyer, Bruce D.; Neville, William A.; Rozzo, Nancy A.; and Bourne, Richard G., to R.G.B. Laboratories Inc. Mineral enrichment composition and method of preparing same. 4,351,735, Cl. 252-1.000.

Buhrmann, David L.: *See*—
Bronkhorst, Arie J., 4,351,324, Cl. 128-80.00J.

Buis, Jacob A. M.: *See*—
Van Herk, Alfred; Buis, Jacob A. M.; Klijnstra, Jan H.; and Van Staalduinen, Jan, 4,352,131, Cl. 360-78.000.

Bunker Ramo Corporation: *See*—
Parrillo, Michael R.; and Colwell, John C., 4,351,343, Cl. 128-695.000.

Burgdorf, Jochen, to ITT Industries, Inc. Sliding guide for a floating caliper disc brake. 4,351,420, Cl. 188-73.450.

Burlington Industries, Inc.: *See*—
Finlayson, James E., III; Holder, Joseph P.; Holt, L. Earl; and Lee, Seung Y., 4,351,638, Cl. 8-463.000.

Burns, Terry A.; and Johnston, Leslie H., to International Business Machines Corporation. Magnetic head assembly with corrosion resistant conductive wire. 4,352,134, Cl. 360-123.000.

Burroughs Corporation: *See*—
Andreadakis, Nicholas C., 4,352,040, Cl. 313-217.000.
Brooks, David L., II, 4,351,547, Cl. 283-8.00R.
DeMoss, Dean; and Richardson, Harvey J., 4,352,135, Cl. 360-133.000.
Fasig, Harold A.; and Paananen, Eugene E., 4,352,013, Cl. 250-223.00R.

C. M. Kemp Manufacturing Co., The: *See*—
Psaras, John D.; and Zahniser, James A., 4,351,732, Cl. 210-689.000.

Calhoun, Leslie D.; and Peeples, Marion E., to McDonnell Douglas Corporation. Inverted meniscus heat pipe. 4,351,388, Cl. 165-104.260.

California Institute of Technology: *See*—
Yariv, Amnon; Margalit, Shlomo; and Lee, Chien-Ping, 4,352,116, Cl. 357-17.000.

Call, Enos P., to Dana Corporation. Axle drive assembly. 4,351,407, Cl. 180-75.000.

Calundann, Gordon W.; Charbonneau, Larry F.; and East, Anthony J., to Celanese Corporation. Poly(ester-amide) capable of forming an anisotropic melt phase derived from 6-hydroxy-2-naphthoic acid, aromatic monomer capable of forming an amide linkage, and other aromatic hydroxyacid. 4,351,917, Cl. 524-602.000.

Calundann, Gordon W.: *See*—
Charbonneau, Larry F.; East, Anthony J.; and Calundann, Gordon W., 4,351,918, Cl. 524-602.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Milne, Robert, 4,352,108, Cl. 343-756.000.

Canon Denshi Kabushiki Kaisha: *See*—
Ohniwa, Takehiko; and Saito, Syuichiro, 4,351,596, Cl. 354-234.000.

Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Sakurada, Nobuaki; and Shimizu, Masami, 4,351,595, Cl. 354-173.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; and Watanabe, Yoshiaki, 4,351,597, Cl. 354-266.000.
Hirano, Reiji; and Nakata, Shinichi, 4,352,161, Cl. 364-706.000.
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, 4,351,590, Cl. 352-140.000.
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,351,609, Cl. 355-50.000.
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.
Ohniwa, Takehiko; and Saito, Syuichiro, 4,351,596, Cl. 354-234.000.
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,351,598, Cl. 354-288.000.
Suzuki, Toyotosi; Matsuda, Mutsuhide; and Tamamura, Hideo, 4,351,599, Cl. 354-288.000.

Caracappa, Michael G., to RCA Corporation. System and method for frequency discrimination. 4,352,194, Cl. 375-89.000.

Cardew, Kenneth H. F., to United Kingdom of Great Britain and Northern Ireland, The Minister for Transport in Her Britannic Majesty's Government of the. Strop restraining means. 4,351,545, Cl. 280-806.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Colombo, Bruno; and Tosi, Bruno, 4,351,193, Cl. 73-864.820.

Carlson, David J.; and Tsou, Sander H. C., to RCA Corporation. Multi-band antenna coupling network. 4,352,111, Cl. 343-860.000.

Carlsson, Lars, to Tetra Pak International AB. Method and an arrangement for the feed of a material web. 4,351,461, Cl. 226-28.000.

Carnahan, Howard L.: *See*—
Rutger, J. Neil; and Carnahan, Howard L., 4,351,130, Cl. 47-58.000.

Carney, Andrew L. Methods of securing electrodes to the heart. 4,351,345, Cl. 128-786.000.

Carney, Murray C.: *See*—
Dyer, Robert E.; and Carney, Murray C., 4,352,009, Cl. 235-92.0ST.

Carney, Richard E. Combined remote control for wireless communication equipment and associated antenna. 4,352,202, Cl. 455-151.000.

Carpenter, Vance J.; and Yang, Eugene L., to Xerox Corporation. Controlled velocity transport precession system. 4,351,605, Cl. 355-8.000.

Carr, John A. Machine tool for scribing arcs and circles. 4,351,111, Cl. 30-164.900.

Carrier Corporation: *See*—
Geary, Carl H.; and Samurin, Norman A., 4,352,024, Cl. 290-52.000.

Carson, Donald G. Precision positioning apparatus having a rotating driving element and a rotating driven element. 4,351,197, Cl. 74-89.220.

CASCO Inc.: *See*—
McGuire, Hugh K., 4,351,682, Cl. 156-143.000.

Cassar, Luigi: *See*—
Foa, Marco; Moro, Alessandro; Gardano, Andrea; and Cassar, Luigi, 4,351,952, Cl. 562-406.000.

Castillo-Gonzalez, Ricardo, to Cia Minera Rio Colorado, S.A. Separation of arsenic from fluorite ore, by means of magnetic separation and flotation of the pyrites to which it is associated. 4,351,483, Cl. 241-24.000.

Caterpillar Tractor Co.: *See*—
Moore, John A., 4,351,533, Cl. 277-83.000.

Cavallari, Bruno: *See*—
Bellicardi, Francesco; Dall'Osso, Carlo; and Cavallari, Bruno, 4,351,782, Cl. 261-39.00A.

Cave, David L.; Harris, Steven L.; and Zobel, Don W., to Motorola, Inc. Solid-state voltage reference providing a regulated voltage having a high magnitude. 4,352,056, Cl. 323-314.000.

Celanese Corporation: *See*—
Calundann, Gordon W.; Charbonneau, Larry F.; and East, Anthony J., 4,351,917, Cl. 524-602.000.
Charbonneau, Larry F.; East, Anthony J.; and Calundann, Gordon W., 4,351,918, Cl. 524-602.000.
Lu, Shau-Zou; and Druin, Melvin, 4,351,758, Cl. 524-227.000.
Warner, Steven B., 4,351,925, Cl. 525-369.000.
Witt, Enrique R., 4,351,729, Cl. 210-603.000.

Centre de Recherches Metallurgiques-Centrum Voor Research In De Metallurgie: *See*—
Cosse, Paul; and Pelerin, Jacques, 4,351,862, Cl. 427-300.000.
Pelerin, Jacques, 4,351,854, Cl. 427-34.000.

Centre Electronique Horloger S.A.: *See*—
Dessoulavy, Roger, 4,352,069, Cl. 328-127.000.

Centro Ricerche Fiat S.p.A.: *See*—
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,351,295, Cl. 123-300.000.

Cerberus AG: *See*—
Christen, Peter; Brandli, Hansheinrich; Durrer, Bernhard; and Sauerbrey, Arnim, 4,352,099, Cl. 340-633.000.

Cesark, Frank F.; and Thomas, Daniel W., to American Cyanamid Company. Oxime ethers of 4,4'-bis(N,N-diethylamino)benzhydrol and pressure-sensitive recording systems containing them. 4,351,956, Cl. 564-256.000.

Cetus Corporation: *See*—
Bahl, Chander P., 4,351,901, Cl. 435-91.000.
Neidleman, Saul L.; Amon, William F., Jr.; and Geigert, John, 4,351,902, Cl. 435-137.000.

Chamberlin, Thomas A.; and Tomalia, Donald A., to Dow Chemical Co., The. Vinyl substituted cyclic polyethers and addition polymers thereof. 4,351,933, Cl. 526-266.000.

Champion Spark Plug Company: *See*—
Mahaney, Robert A., 4,351,291, Cl. 123-145.00A.

Chan, Hak-Foon, to Rohm and Haas Company. Fungicidal 2-aryl-2-1-H-azoyl-(alkyl)-gamma-butyrolactones. 4,351,839, Cl. 424-269.000.

Chan, Henry C.: *See*—
Owens, William R.; Chan, Henry C.; Abraham, Ooriapadical C.; and Parker, Levi C., 4,351,649, Cl. 55-162.000.

Chance, Dudley A., to International Business Machines Corporation. Gas laser and method of manufacturing. 4,352,184, Cl. 372-61.000.

Chandesais, Jean L. Ring lighting for microscopes. 4,351,584, Cl. 350-89.000.

Chappell, Terry I.; Pettit, Geroge D.; and Woodall, Jerry M., to International Business Machines Corporation. Electrochemically eroding semiconductor device. 4,351,706, Cl. 204-129.300.

Charbonneau, Larry F.; East, Anthony J.; and Calundann, Gordon W., to Celanese Corporation. Poly(ester-amide) capable of forming an anisotropic melt phase derived from 6-hydroxy-2-naphthoic acid, other aromatic hydroxyacid, carbocyclic dicarboxylic acid, and aromatic monomer capable of forming an amide linkage. 4,351,918, Cl. 524-602.000.

Charbonneau, Larry F.: *See*—
Calundann, Gordon W.; Charbonneau, Larry F.; and East, Anthony J., 4,351,917, Cl. 524-602.000.

Chas. A. Blatchford & Sons Limited: *See*—
Blatchford, Brian G., 4,351,070, Cl. 3-27.000.

Chartrand, Joseph A.; and Perreault, Irenee. Process and apparatus for recycling organic wastes. 4,351,250, Cl. 110-227.000.

Chary, Rajagopala M. N. Light shield for vehicles having transparent members. 4,351,557, Cl. 296-97.00D.

Chauve, Jean, to Societe Anonyme Francaise du Ferodo. Industrial disc brake. 4,351,422, Cl. 188-170.000.

Chavel, Pierre H.; Sawchuk, Alexander A.; Soffer, Bernard H.; Strand, Timothy C.; and Tanguay, Armand R., Jr., to Hughes Aircraft Company. Method and apparatus for optical computing and logic processing by mapping of input optical intensity into position of an optical image. 4,351,589, Cl. 350-342.000.

Chemie-Anlagenbau Bischofsheim GmbH: *See*—
Hilterhaus, Karl-Heinz; and Moser, Reinhard, 4,351,354, Cl. 137-240.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Krebs, Waldemar; and Bromme, Hermann, 4,351,654, Cl. 62-13.000.

Chester, Arthur W.; and Chu, Yung F., to Mobil Oil Corporation. Manufacture of aromatic compounds. 4,351,979, Cl. 585-481.000.

Chevron Research Company: *See*—
Ferm, Richard L.; and Latif, Chester C., 4,351,750, Cl. 524-8.000.

Child, Edward T.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.

Childs, William H.; and Mahle, Christoph E., to Communications Satellite Corporation. Planar QPSK demodulator. 4,352,071, Cl. 329-105.000.

China National Light Industrial Products Import Export Corporation, Shantung Branch: *See*—
Tsui, Yaiman, 4,351,171, Cl. 70-339.000.

Choi, Mansam, to Anthony Manufacturing Corporation. Pop-up sprinkler. 4,351,477, Cl. 239-205.000.

Christen, Peter; Brandli, Hansheinrich; Durrer, Bernhard; and Sauerbrey, Arnim, to Cerberus AG. Gas sensing unit for use in environment comprising explosive gases. 4,352,099, Cl. 340-633.000.

Christensen, Inc.: *See*—
Fielder, Coy M., 4,351,401, Cl. 175-329.000.

Christiani, Peter. Porous salad bowl including ribbed lid for cooling. 4,351,164, Cl. 62-315.000.

Chu, Yung F.: *See*—
Chester, Arthur W.; and Chu, Yung F., 4,351,979, Cl. 585-481.000.

Chubu Electric Power Co., Inc., The: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,351,834, Cl. 424-249.000.

Chugairo Kogyo Kaisha Ltd.: *See*—
Nagai, Kiyokazu, 4,351,632, Cl. 431-183.000.

Chugoku Electric Power Co., Inc., The: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Chung, Ha D., to Han Baek Trading Co., Ltd. Rubber sealed metal vacuum bottle and stopper caps therefor. 4,351,451, Cl. 220-420.000.

Chupp, John P., to Monsanto Company. Herbicidal tertiary 2-haloacetamides. 4,351,667, Cl. 71-118.000.

Cia Minera Rio Colorado, S.A.: *See*—
Castillo-Gonzalez, Ricardo, 4,351,483, Cl. 241-24.000.

Ciba-Geigy AG: *See*—
Baumgartner, Peter; Karlen, Urs; and Keller, Urs, 4,351,774, Cl. 260-383.000.
Coote, Jack H.; and Jenkins, Arthur P., 4,351,608, Cl. 355-35.000.
Tzikas, Athanassios, 4,351,975, Cl. 570-209.000.

Ciba-Geigy Corporation: *See*—
Berner, Godwin; and Kirchmayr, Rudolf, 4,351,708, Cl. 204-159.230.
Maier, Ludwig, 4,351,779, Cl. 260-970.000.
Marshall, Alan, 4,351,796, Cl. 422-15.000.
Martin, Pierre; Steiner, Eginhard; and Bellus, Daniel, 4,351,961, Cl. 568-381.000.
Spivack, John D., 4,351,759, Cl. 524-100.000.

Clar, Milton. Water-saving device. 4,351,071, Cl. 4-324.000.

Clark, David F., to Stanley Works, The. Method of bonding silicone rubber to non-silicone adhesive. 4,351,686, Cl. 156-329.000.

Clark, Dewey: *See*—
Selvidge, Richard H.; and Clark, Dewey, 4,351,300, Cl. 123-527.000.

Clark, John I.; Mengel, Loretta S.; and Benedek, George B., to Massachusetts Institute of Technology. Process for preventing or reversing cataract formation using acrylamides. 4,351,826, Cl. 424-81.000.

Clark, Larry G. Pass-through for drive-up window. 4,351,247, Cl. 109-19.000.

Clark, Leslie, to Roneo Alcatel Limited. Duplicating stencil. 4,351,685, Cl. 156-234.000.

Clarkson, James A. Hinged gutter guard. 4,351,134, Cl. 52-12.000.

Claytor, Elizabeth A.: *See*—
Reusser, Robert E.; Claytor, Elizabeth A.; and Jones, Brenton E., 4,351,980, Cl. 585-820.000.

Clements, Gary B.; and Ramsey, Robert E., to Hinderliter Energy Equipment Corp. Spring clip for wellhead slips. 4,351,090, Cl. 24-263.00D.

Clompus, I. Bertram. Key actuated locking bolt. 4,351,170, Cl. 70-90.000.

Clyde, Robert A. Horizontal fermenter. 4,351,905, Cl. 435-316.000.

Coats, John H.: *See*—
Whaley, Howard A.; and Coats, John H., 4,351,769, Cl. 260-326.340.

Cobleigh, Wendall C.; and Barmore, Donald L., to Professional Marketing Associates. Film dispenser and slitter. 4,351,208, Cl. 83-167.000.

Cocks, Philip J., to Dunlop Limited. Steel reinforced pipe. 4,351,364, Cl. 138-133.000.

Cognata, Richard. Cover for a channel clip binder and method of making same. 4,351,546, Cl. 281-45.000.

Cohn, Alan E., to Goodyear Tire & Rubber Company, The. Method of constructing tire and identification tag therefor. 4,351,548, Cl. 283-21.000.

Colby, Dwight D., to Honeywell Inc. Liquid gaging system lost sensor recovery. 4,352,159, Cl. 364-509.000.

Coles, Richard J., to Glaxo Laboratories Limited. N-Cyclopropylisoindolines. 4,351,842, Cl. 424-274.000.

Colgate Palmolive Company: *See*—
Joshi, David; and Klingaman, Richard, 4,351,740, Cl. 252-90.000.

Collins, H. Thomas: *See*—
Heinz, Edward J.; and Collins, H. Thomas, 4,351,623, Cl. 405-210.000.

Colombo, Bruno; and Tosi, Bruno, to Carlo Erba Strumentazione S.p.A. Sampler for analytical detection systems. 4,351,193, Cl. 73-864.820.

Columbian Chemicals Company: *See*—
Glasstetter, Fred E.; and Eckert, Frank J., 4,351,815, Cl. 423-445.000.

Colwell, John C.: *See*—
Parrillo, Michael R.; and Colwell, John C., 4,351,343, Cl. 128-695.000.

Combustion Engineering, Inc.: *See*—
Stockman, Richard F., 4,351,392, Cl. 165-186.000.

Cominco Ltd.: *See*—
Stephenson, Leonard P.; and Schweizer, Arthur A., 4,351,668, Cl. 75-2.000.

Commissariat a l'Energie Atomique: *See*—
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,351,794, Cl. 376-404.000.
Gervais, Yvon; Gillet, Renen; and Tanis, Georges, 4,352,004, Cl. 219-121.0ED.

Communications Satellite Corporation: *See*—
Childs, William H.; and Mahle, Christoph E., 4,352,071, Cl. 329-105.000.

Compagnie Generale de Geophysique: *See*—
Beauducel, Claude; and Cretin, Jacques, 4,352,070, Cl. 328-151.000.

Compagnie Generale de Radiologie: *See*—
Gabbay, Emile, 4,352,196, Cl. 378-125.000.

Compagnie Industrielle des Telecommunications CIT-ALCATEL: *See*—
Le Dieu, Bernard; and Herledan, Jean-Rene, 4,352,181, Cl. 370-105.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See*—
Floury, Claude P.; Guillet, Claude L. J. M.; Lokocki, James A.; Devoille, Maurice R.; and Fanene, Bernard, 4,351,468, Cl. 228-4.500.

Compania Espanola de Petroleos, S.A.: *See*—
LLorente Agudo, Nieves; Elia Miguel, Maria F.; Aranguren Escobar, Maria A.; Pares Olivet, Eulalia; and Fernandez Garvajosa, Jose M., 4,351,903, Cl. 435-234.000.

Concannon, Thomas P., to Du Pont de Nemours, E. I., and Company. Article coated with fluoropolymer finish with improved durability. 4,351,882, Cl. 428-422.000.

Conoco Inc.: *See—*
Newman, Bruce A.; and Boyer, Lyndon D., 4,351,702, Cl. 201-5.000.
Container Corporation of America: *See—*
Helms, Charles R., 4,351,436, Cl. 206-477.000.
Continental Group, Inc., The: *See—*
Giggard, Earl D.; Khoury, Nick S.; Kowalik, John J.; and Terrien, Donald R., 4,351,445, Cl. 220-91.000.
Convey, Inc.: *See—*
Brown, Paul C., 4,351,213, Cl. 84-1.010.
Cook, Kenneth J.: *See—*
Schultz, Edward R., Jr.; Cook, Kenneth J.; Power, Joseph S.; and Ruszala, Frederick B., 4,352,163, Cl. 364-801.000.
Coote, Jack H.; and Jenkins, Arthur P., to Ciba-Geigy AG. Filter head. 4,351,608, Cl. 355-35.000.
Coplan, Myron J.: *See—*
Sebring, Robert E.; and Coplan, Myron J., 4,351,092, Cl. 28-100.000.
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., to General Motors Corporation. Multicylinder swash plate compressor piston ring arrangement. 4,351,227, Cl. 92-71.000.
Corboy, John F., Jr.: *See—*
Duffy, Michael T.; Corboy, John F., Jr.; and Zanzucchi, Peter J., 4,352,017, Cl. 250-358.100.
Cordier, Georges, to Rhone-Poulenc Agrochimie. Process for preparation of anilines substituted by chlorine in the meta-position. 4,351,959, Cl. 564-412.000.
Cordle, Paul E.: *See—*
McCubbin, Melvin J.; Johnson, Clifford T.; and Cordle, Paul E., 4,351,240, Cl. 102-364.000.
Cormier, Raymond G.; and Gibbs, John D., to Nashua Corporation. Sheet stripping hold down assembly. 4,351,601, Cl. 355-3.0SH.
Cornelis, Christiaan A.; and van Prooijen, Pieter, to IHC Holland N.V. System for controlling the position of the drag pipe of a dredge. 4,351,122, Cl. 37-58.000.
Corner, Michael R.; Kemp, Ian; and French, Tom, to Dunlop Limited. Tire and wheel rim assemblies. 4,351,382, Cl. 152-330.0RF.
Cornetti, Giorgio: *See—*
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,351,295, Cl. 123-300.000.
Corning Glass Works: *See—*
Bansal, Bihari, 4,351,664, Cl. 65-128.000.
Boudot, Jean E.; Mazeau, Jean P.; and Michaud, Andre C., 4,351,906, Cl. 501-74.000.
Elmer, Thomas H.; and Wu, Che-Kuang, 4,351,662, Cl. 65-30.100.
Olshansky, Robert, 4,351,658, Cl. 65-3.120.
Correll, Glenn D.; and Friedli, Hans R., to Dow Chemical Company, The. Hydrolysis of carbon oxysulfide with morpholines and piperazines. 4,351,812, Cl. 423-243.000.
Cosse, Paul; and Pelerin, Jacques, to Centre de Recherches Metallurgiques-Centrum Voor Research In De Metallurgie. Continuous hot-dip coating of metal strip. 4,351,862, Cl. 427-300.000.
Costamagna, Robert M.; Mori, Denis W.; and Bardetti, Allen R., to McCormick & Company, Incorporated. Process of producing a batter-coated onion product. 4,351,850, Cl. 426-302.000.
Costello, Christopher, to Lucas Industries Limited. Fuel injection system. 4,351,299, Cl. 123-472.000.
Coulter Electronics, Inc.: *See—*
Leif, Robert C., 4,351,611, Cl. 356-328.000.
Courneya, Calice G. Apparatus for extracting potable water. 4,351,651, Cl. 55-210.000.
Crane, Dale E., to Uniphase Corporation. Gas laser having improved stability against environmental conditions. 4,352,185, Cl. 372-29.000.
Crepeau, Charles E.: *See—*
Mulvey, Robert F.; and Crepeau, Charles E., 4,351,867, Cl. 428-70.000.
Cresap, Charles N. Sintered polymer moldings and composites having altered cross section(s): fluid compacting and sintering process and apparatus for making same. 4,351,869, Cl. 428-121.000.
Cretin, Jacques: *See—*
Beauducel, Claude; and Cretin, Jacques, 4,352,070, Cl. 328-151.000.
Crick, Aubrey M.: *See—*
Phillips, Michael J.; and Crick, Aubrey M., 4,351,586, Cl. 350-96.200.
Crisp, Melvin L., Jr. Double acting exerciser. 4,351,527, Cl. 272-137.000.
Crompton & Knowles Corporation: *See—*
Guy, David A.; and Nims, Philip A., 4,351,370, Cl. 139-450.000.
Crooks, Horatio N., to RCA Corporation. Video disc player having record side identifying apparatus. 4,352,175, Cl. 369-77.000.
Cross, Carroll N. Display mount and method. 4,351,123, Cl. 40-120.000.
Cross, James A.; and Snyder, John E., to R.F. Technical Products, Inc. Noise suppression circuit. 4,352,207, Cl. 455-223.000.
Crouch, Donald W., to General Electric Company. High-potential testing of vacuum-type circuit interrupters. 4,351,992, Cl. 200-144.00B.
Crouch, William B.: *See—*
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.
Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. 2-[(3-Indolyl)carbonyl]-4/5-carboxybenzoic acids. 4,351,768, Cl. 260-326.13R.
Crouse, William G.; and Knox, Charles R., to International Business Machines Corp. Speech detector with variable threshold. 4,351,983, Cl. 179-1.0SC.
Crute, Billy G., to Stant Inc. Valving assembly for a liquid-containing tank. 4,351,350, Cl. 137-39.000.
Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Billi, Roberto; and Scagliola, Carlo, 4,352,182, Cl. 371-22.000.
Csoke, Istvan: *See—*
Farkas, Peter E., 4,351,145, Cl. 56-400.160.
Culbro Corporation: *See—*
Dreher, Hans C., 4,351,679, Cl. 156-70.000.
Cunningham, Vernon R., to Rockwell International Corporation. Split phase delay equalizer with single transformer and adjustment for Q loss. 4,352,075, Cl. 333-28.00R.
Cuomo, Jerome J.; and Harper, James M. E., to International Business Machines Corporation. Low energy ion beam oxidation process. 4,351,712, Cl. 204-192.0EC.
Cuomo, Jerome J.; Dreyfus, Russell W.; and Woodall, Jerry M., to International Business Machines Corporation. Electron source. 4,352,117, Cl. 357-30.000.
Currans, James H. Linear, gas to voltage transducer circuit. 4,351,181, Cl. 73-23.000.
Curtis, George F., to Maremont Corporation. Bipod mechanism for small arms. 4,351,224, Cl. 89-37.0BA.
Cyrot, Luc P., to Parker-Hannifin Corporation. Fluid control system. 4,351,226, Cl. 91-387.000.
Dabney, James H. Time domain multiplexing apparatus for multiple microphones. 4,352,179, Cl. 370-6.000.
Dahlquist, E. Arthur. Tree planter and trailer. 4,351,253, Cl. 111-2.000.
Daido Sanso Kabushiki Kaisha: *See—*
Hatano, Yasuhiro; and Nakao, Kazumune, 4,351,978, Cl. 585-469.000.
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A. Method and apparatus for powder scarfing of metal. 4,351,676, Cl. 148-9.00C.
Daikin Kogyo Co., Ltd.: *See—*
Fukui, Shosin; and Shinjo, Masayoshi, 4,351,880, Cl. 428-378.000.
Dainippon Ink & Chemicals, Inc.: *See—*
Ariga, Nagao; Shimazu, Kyotaro; Takenaka, Hidenori; and Sato, Hiroyuki, 4,351,920, Cl. 525-67.000.
Dalebout, Melvin W., to Engineered Sports Products, Inc. Removable traction surfaces for footwear. 4,351,120, Cl. 36-117.000.
Dall'Osso, Carlo: *See—*
Bellicardi, Francesco; Dall'Osso, Carlo; and Cavallari, Bruno, 4,351,782, Cl. 261-39.00A.
Dampier, Frederick W.; and Kalivas, Risty T., to GTE Laboratories Incorporated. Electrochemical cell. 4,351,888, Cl. 429-62.000.
Dana Corporation: *See—*
Call, Enos P., 4,351,407, Cl. 180-75.000.
Das, Balbhadra; and Fahey, Dennis M., to PPG Industries, Inc. Detackified aqueous sizing composition comprising liquid polymer and free radical generator. 4,351,752, Cl. 523-401.000.
Data Master: *See—*
Gyi, Koko, 4,352,132, Cl. 360-97.000.
Datagraphix, Inc.: *See—*
Link, William T.; Runyan, Steven R.; and Hobson, Stephen, 4,351,592, Cl. 353-72.000.
Date, Nobuaki; Sakurada, Nobuaki; and Shimizu, Masami, to Canon Kabushiki Kaisha. Motor drive camera. 4,351,595, Cl. 354-173.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Camera having electromagnetic release control. 4,351,597, Cl. 354-266.000.
Date, Tasuku; Nomura, Toshio; and Kobayashi, Isao, to Honda Giken Kogyo Kabushiki Kaisha. Engine fuel supply controlling system. 4,352,158, Cl. 364-431.050.
Dautremay, Alain; and Boljevic, Jean M., to Thomson-CSF. Device for the synchronization of a timing signal. 4,352,195, Cl. 375-120.000.
Dautremay, Alain: *See—*
Perez, Andre; Boljevic, Jean M.; and Dautremay, Alain, 4,352,192, Cl. 375-56.000.
Davies, Michael J., to United Kingdom Atomic Energy Authority. Method of making spark plugs. 4,351,095, Cl. 29-25.120.
Davis, Christopher K.; and Mitchell, Richard F., to U.S. Philips Corporation. Information transmission system. 4,352,183, Cl. 371-33.000.
Davis, Duane A., to GAF Corporation. Double faced insulating board. 4,351,873, Cl. 428-198.000.
Davis, Grant L.: *See—*
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,351,688, Cl. 156-358.000.
Davis, T. Grant, to Fairchild Camera & Instrument Corp. Alignment target for electron-beam write system. 4,351,892, Cl. 430-30.000.
Day, Clive R.: *See—*
Beales, Keith J.; Day, Clive R.; and Newns, George R., 4,351,659, Cl. 65-3.130.
Day, Winterton U., to Kimberly-Clark Corporation. Method for dry forming a uniform web of fibers. 4,351,793, Cl. 264-518.000.
DC Electronic Industries, Inc.: *See—*
Ottone, Robert J., 4,352,067, Cl. 324-434.000.
DEC International: *See—*
Meade, Reginald E., 4,351,849, Cl. 426-61.000.
Decker, Heinz: *See—*
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.

Deere & Company: *See*—
Ahlschwede, Brian A., 4,351,568, Cl. 301-36.00R.
Bedis, Michael; and Westemeier, Donald E., 4,351,573, Cl. 305-54.000.
Roesner, Keith G., 4,351,863, Cl. 427-421.000.
Verhulst, Michael J., 4,351,551, Cl. 289-2.000.
Degussa AG: *See*—
Kleemann, Axel; and Schalke, Peter M., 4,351,778, Cl. 260-465.80R.
Degussa Aktiengesellschaft: *See*—
Kriebitzsch, Norbert; Puschner, Kurt; and Hentschel, Klaus, 4,351,644, Cl. 23-293.00R.
De Jule, Michael C., to Lucitron, Inc. Flat panel display system. 4,352,101, Cl. 340-769.000.
Dekkers, Nicolaas H.: *See*—
Jore, Alfred; Van Gorkom, Gerardus G. P.; and Dekkers, Nicolaas H., 4,352,015, Cl. 250-311.000.
Delay, Francois, to Firmenich SA. Norbornane (-ene) derivatives and their use as perfuming ingredients. 4,351,748, Cl. 252-522.00R.
Delgado, Manuel O., Jr. Liquified gas pumping and cylinder re-fill system. 4,351,372, Cl. 141-2.000.
Demerson, Christopher A.: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,351,942, Cl. 546-269.000.
DeMoss, Dean; and Richardson, Harvey J., to Burroughs Corporation. Floppy pack with improved spacer means. 4,352,135, Cl. 360-133.000.
Dennis, James T.; and Kolomayets, George, to Dennis, James T. Automatic record player. 4,352,177, Cl. 369-246.000.
Dennisson, James W.: *See*—
Ingersoll, Brian E.; Nicholson, Ross C.; and Dennisson, James W., 4,351,448, Cl. 220-318.000.
De Paolis, Chiara: *See*—
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,351,829, Cl. 424-177.000.
Depoisier, Jean-Claude; and Rogier, Leonce E. R., to Societe Anonyme Francaise du Ferodo. Method of improving friction contact between friction elements of a static brake and improved friction element. 4,351,885, Cl. 428-544.000.
de Putter, Warner J., to Wavin B.V. Method for installing a sealing body in a groove of a socket and pipe part of plastic material. 4,351,791, Cl. 264-267.000.
Depweg, Frank A.; and Zukowski, Edward A., to White Consolidated Industries, Inc. Multiple spindle rotary indexing machine tool. 4,351,096, Cl. 29-38.00A.
der Wissenschaften e.V. Max-Planck-Gesellschaft zur/Forderung: *See*—
Birr, Christian, 4,351,764, Cl. 260-112.700.
Dessoulavy, Roger, to Centre Electronique Horloger S.A. Switched capacitance signal processor. 4,352,069, Cl. 328-127.000.
Deuser, Norbert; and Diemer, Peter, to Krupp-Koppers GmbH. Method for the production of synthesis gas. 4,351,742, Cl. 252-373.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Recursive formant generator for an electronic musical instrument. 4,351,218, Cl. 84-1.190.
Devoille, Maurice R.: *See*—
Floury, Claude P.; Guillet, Claude L. J. M.; Lokocki, James A.; Devoille, Maurice R.; and Fanene, Bernard, 4,351,468, Cl. 228-4.500.
Diemer, Peter: *See*—
Deuser, Norbert; and Diemer, Peter, 4,351,742, Cl. 252-373.000.
Dillon, Robert H.: *See*—
Hirt, Theodore A.; and Dillon, Robert H., 4,351,713, Cl. 204-207.000.
Dionex Corporation: *See*—
Stevens, Timothy S., 4,351,909, Cl. 521-28.000.
Dischert, Robert A.: *See*—
Reitmeier, Glenn A.; and Dischert, Robert A., 4,352,122, Cl. 358-11.000.
Di Sciascio, Nicola: *See*—
Filidoro, Roberto; and Di Sciascio, Nicola, 4,351,353, Cl. 137-219.000.
Dixon Automatic Tool, Inc.: *See*—
Dixon, Paul H., 4,351,637, Cl. 474-148.000.
Dixon, Paul H., to Dixon Automatic Tool, Inc. Precision chain drive. 4,351,637, Cl. 474-148.000.
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., to American Home Products Corp. Isochromans. 4,351,942, Cl. 546-269.000.
Doi, Keiichiro: *See*—
Kondo, Shigeki; Iketani, Tomofumi; Yamazaki, Yoshio; Doi, Keiichiro; and Tanaka, Seiji, 4,351,996, Cl. 219-10.49R.
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, to Mitsubishi Petrochemical Company Limited. Laminate films and sheets of crosslinked polyethylene resins. 4,351,876, Cl. 428-349.000.
Donaldson Company, Inc.: *See*—
Gillingham, Gary R., 4,351,567, Cl. 299-45.000.
Donskoi, Leonid: *See*—
Rehme, Wilfried; Stipura, Anatoly; Ripnyi, Victor; Donskoi, Leonid; and Schevtschenko, Nikolai, 4,351,190, Cl. 73-638.000.
Dornier System GmbH: *See*—
Schmidberger, Rainer, 4,351,182, Cl. 73-27.00R.
Doublewal Corporation: *See*—
Toffolon, Roger L.; and Kart, Warren E., 4,351,507, Cl. 249-63.000.
Dove, Norman F. Steam distribution apparatus for the nip of two rolls. 4,351,700, Cl. 162-252.000.
Dover Corporation: *See*—
Polson, Charles L., 4,351,375, Cl. 141-98.000.
Dow Chemical Co., The: *See*—
Chamberlin, Thomas A.; and Tomalia, Donald A., 4,351,933, Cl. 526-266.000.
Correll, Glenn D.; and Friedli, Hans R., 4,351,812, Cl. 423-243.000.
Gibbs, Dale S.; and Foye, Duane F., 4,351,929, Cl. 526-80.000.
Ishibe, Nobuyuki; and Richey, Warren F., 4,351,973, Cl. 570-104.000.
Malhotra, Sudarshan K., 4,351,943, Cl. 546-301.000.
McMillan, William J.; and Severson, Jerry L., 4,351,138, Cl. 52-309.400.
Smith, Harry A., 4,351,928, Cl. 525-443.000.
Stevens, Timothy S., 4,351,909, Cl. 521-28.000.
Dowell, Harlan T.: *See*—
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,351,688, Cl. 156-358.000.
Dowler, Warren L.: *See*—
Harper-Tervet, Jan; Dowler, Warren L.; Yen, Shiao-Ping S.; and Mueller, William A., 4,351,878, Cl. 428-367.000.
Dragerwerk Aktiengesellschaft: *See*—
Rinne, Gerhart; and Heim, Ulrich, 4,351,327, Cl. 128-200.140.
Dravo Corporation: *See*—
Fenton, Edward A., Jr.; Lakin, Ira W.; and Blair, Gilbert, 4,351,431, Cl. 198-823.000.
Dreher, Hans C., to Culbro Corporation. Label-leaflet applying apparatus. 4,351,679, Cl. 156-70.000.
Dresser Industries, Inc.: *See*—
Blatter, Kenneth F., 4,351,781, Cl. 261-29.000.
Schoonover, Larry G., 4,352,166, Cl. 367-69.000.
Drew, Ralph H., Jr.: *See*—
Koller, Floyd G.; and Drew, Ralph H., Jr., 4,351,355, Cl. 137-329.060.
Drexel, Peter; Maier, Gernot; and Leisner, Ernst, to Robert Bosch GmbH. Article handling and transfer apparatus unit. 4,351,628, Cl. 414-749.000.
Dreyer, Heinz, to Amazonen-Werke. Centrifugal spreader, especially for granulated fertilizers. 4,351,481, Cl. 239-670.000.
Dreyfus, Russell W.: *See*—
Cuomo, Jerome J.; Dreyfus, Russell W.; and Woodall, Jerry M., 4,352,117, Cl. 357-30.000.
Drlik, Gunther, to OBE-Werk Ohnmacht & Baumgartner GmbH & Co. K.G. Biased eyeglass hinge. 4,351,086, Cl. 16-228.000.
Drodofsky, Reinhold: *See*—
Duke, Douglas; Drodofsky, Reinhold; and Galaske, Folker, 4,351,619, Cl. 400-196.100.
Drori, Mordeki. Stabilized projectiles. 4,351,503, Cl. 244-3.240.
Droscher, Erich; Pfundner, Hans P.; and Wrulich, Herwig, to Voest-Alpine Aktiengesellschaft. Device for preventing collision between part of the cutting arm and part of the loading ramp for a cutting machine. 4,351,564, Cl. 299-1.000.
Drucker, Fred F.: *See*—
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, 4,351,165, Cl. 62-371.000.
Drug Science Foundation: *See*—
Walle, Thomas, 4,351,848, Cl. 424-330.000.
Druin, Melvin: *See*—
Lu, Shau-Zou; and Druin, Melvin, 4,351,758, Cl. 524-227.000.
Ductmate Industries, Inc.: *See*—
Arnoldt, Peter J., 4,352,003, Cl. 219-103.000.
Duffy, Michael T.; and Zanzucchi, Peter J., to RCA Corporation. Method and apparatus for determining the quality of a semiconductor surface. 4,352,016, Cl. 250-358.100.
Duffy, Michael T.; Corboy, John F., Jr.; and Zanzucchi, Peter J., to RCA Corporation. Apparatus for determining the quality of a semiconductor surface. 4,352,017, Cl. 250-358.100.
Duke, Douglas; Drodofsky, Reinhold; and Galaske, Folker, to International Standard Electric Corporation. Ink ribbon cassette. 4,351,619, Cl. 400-196.100.
Duke, June T.: *See*—
Prem, Dorothy C.; Duke, June T.; and Isley, Ralph E., 4,351,756, Cl. 524-314.000.
Dunkle, George H., to Weyerhaeuser Company. Dual cell laminated container. 4,351,471, Cl. 229-15.000.
Dunlop Limited: *See*—
Cocks, Philip J., 4,351,364, Cl. 138-133.000.
Corner, Michael R.; Kemp, Ian; and French, Tom, 4,351,382, Cl. 152-330.0RF.
Dunn, Ervin T. Device for measuring the speed of an object traveling between two fixed points from a stationary observation point. 4,352,064, Cl. 324-178.000.
Duplin, Joseph R., to Brine, William H., Jr. Sports stick handle. 4,351,528, Cl. 273-67.00A.
Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Albert G., 4,351,893, Cl. 430-281.000.
Andrews, Gerald D.; and Sharkey, William H., 4,351,924, Cl. 525-330.600.
Armitage, John B., 4,351,931, Cl. 526-227.000.
Brixius, Darryl W.; and Simms, John A., 4,351,755, Cl. 524-555.000.
Concannon, Thomas P., 4,351,882, Cl. 428-422.000.
Hill, Broadus E., Jr., 4,351,491, Cl. 242-18.0PW.
Hoeschele, Guenther K., 4,351,757, Cl. 524-169.000.
Irwin, Howard D., 4,351,242, Cl. 105-206.00A.
Khanna, Ram-Tirth, 4,351,914, Cl. 523-448.000.
Kohan, Melvin I., 4,351,916, Cl. 524-377.000.

Parish, Darrell J.; and Mallouk, Robert S., 4,351,746, Cl. 252-511.000.
Rajagopalan, Parthasarathi, 4,351,836, Cl. 424-258.000.
Stinger, Henry J., 4,351,745, Cl. 252-511.000.

Du Pont, John P.; Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., to RTE Corporation. Flexible connector for H.V. arrester. 4,352,139, Cl. 361-117.000.

Dupre, Jean, to Rohm and Haas Company. Thickening agent for aqueous compositions. 4,351,754, Cl. 524-445.000.

Durrer, Bernhard: *See*—
Christen, Peter; Brandli, Hansheinrich; Durrer, Bernhard; and Sauerbrey, Arnim, 4,352,099, Cl. 340-633.000.

Dyachkov, Vasily M.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Dyckerhoff & Widman AG: *See*—
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

Dyer, Robert E.; and Carney, Murray C., to Sangamo Weston, Inc. Variable ratio totalizer. 4,352,009, Cl. 235-92.0ST.

Dynamics Corporation of America: *See*—
Valbona, Bruno M.; and Pound, William C., 4,351,612, Cl. 366-206.000.

Eagle Rubber Co., Inc.: *See*—
Erdos, William A., 4,351,521, Cl. 272-52.000.

East, Anthony J.: *See*—
Calundann, Gordon W.; Charbonneau, Larry F.; and East, Anthony J., 4,351,917, Cl. 524-602.000.
Charbonneau, Larry F.; East, Anthony J.; and Calundann, Gordon W., 4,351,918, Cl. 524-602.000.

East Tradacons AG: *See*—
Elwert, Wolfram; and Forster, Gernot, 4,351,435, Cl. 206-379.000.

Eastman Kodak Company: *See*—
Altland, Henry W.; and Shiao, Daniel D., 4,351,896, Cl. 430-354.000.
McCollum, Anthony W.; Edmonson, William L.; and Belote, Stephen N., 4,351,927, Cl. 525-437.000.

Eaton Corporation: *See*—
Bopp, Warren G., 4,351,425, Cl. 192-58.00B.
Bopp, Warren G., 4,351,426, Cl. 192-58.00B.
Bradshaw, Cyril E., 4,351,285, Cl. 123-568.000.
Garnier, John J., 4,351,614, Cl. 374-37.000.
Garrett, Wayne; and Neuman, Richard F., 4,351,419, Cl. 188-71.900.
Worthen, Roger P.; and Larson, Jay M., 4,351,292, Cl. 123-188.0AA.

Ebauches Electroniques SA: *See*—
Leuthold, Oskar, 4,352,073, Cl. 330-264.000.

Eberhardt, H. Alfred, to Hale Fire Pump Company. Heat exchanger for water pumping system. 4,351,391, Cl. 165-154.000.

Eberle, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case. 4,352,002, Cl. 219-78.150.

Eckert, Frank J.: *See*—
Glasstetter, Fred E.; and Eckert, Frank J., 4,351,815, Cl. 423-445.000.

Eddy, William R., to Phillips Petroleum Company. Closure. 4,351,472, Cl. 229-43.000.

Edmonson, William L.: *See*—
McCollum, Anthony W.; Edmonson, William L.; and Belote, Stephen N., 4,351,927, Cl. 525-437.000.

EECO Incorporated: *See*—
Graves, William B.; and Walsh, James F., 4,352,084, Cl. 338-127.000.

Egbert, Bill R. Apparatus and method for determining the osmolarity/-specific gravity of a solution. 4,351,183, Cl. 73-32.00R.

Egelhof, Dieter; and Schmid, Hans R., to J. M. Voith GmbH. Separator for cleaning suspensions. 4,351,728, Cl. 210-415.000.

Eggertsen, Claire C.; and Eggertsen, John H. Pressure sensitive adhesively backed disposable measuring tape and method of manufacture. 4,351,113, Cl. 33-137.00R.

Eggertsen, John H.: *See*—
Eggertsen, Claire C.; and Eggertsen, John H., 4,351,113, Cl. 33-137.00R.

Eguchi, Seiji: *See*—
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,352,157, Cl. 364-200.000.

Ehrfeld, Wolfgang: *See*—
Becker, Erwin W.; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,351,653, Cl. 55-394.000.

Eilhardt, Bernd: *See*—
Bauermeister, Klaus; Ziemek, Gerhard; and Eilhardt, Bernd, 4,351,365, Cl. 138-149.000.

El Paso Polyolefins Company: *See*—
Patnaik, Birendra K., 4,351,930, Cl. 526-125.000.

Electric Power Research Institute, Inc.: *See*—
Moore, Curtis L., 4,352,078, Cl. 336-60.000.
Temple, Victor A. K., 4,352,118, Cl. 357-38.000.

Electroplating Engineers of Japan, Limited: *See*—
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,351,266, Cl. 118-425.000.

Elektroschmelzwerk kempten GmbH: *See*—
Hunold, Klaus; Reinmuth, Klaus; Lipp, Alfred; Napholcz, Johannes; and Arnold, Peter, 4,351,858, Cl. 427-193.000.

Eli Lilly and Company: *See*—
Geselchen, Paul D.; and Shuman, Robert T., 4,351,763, Cl. 260-112.50E.

Elia Miguel, Maria F.: *See*—
LLorente Agudo, Nieves; Elia Miguel, Maria F.; Aranguren Escobar, Maria A.; Pares Olivet, Eulalia; and Fernandez Garvajosa, Jose M., 4,351,903, Cl. 435-234.000.

Elias, William H.; and Granger, Harold M., to Sangamo Weston, Inc. Capacitor for high vibration environments having a controlled gas reservoir. 4,352,147, Cl. 361-433.000.

Elin-Union A.G.: *See*—
Santner, Fritz, 4,352,037, Cl. 310-89.000.

Elisha, Benjamin. Disposal of needles. 4,351,434, Cl. 206-366.000.

Ellestad, Raymond A.; and Bartels, Harold U., to Bear Medical Systems, Inc. High frequency breath pump. 4,351,329, Cl. 128-204.210.

Elliesen, Wolfgang: *See*—
Fehrs, Hellmuth; and Elliesen, Wolfgang, 4,351,464, Cl. 227-7.000.

Elliott, William A.; and Taylor, Thomas J., to Western Electric Company, Inc. Apparatus for the manufacture of multi-conductor flat cable. 4,351,689, Cl. 156-378.000.

Elmer, Thomas H.; and Wu, Che-Kuang, to Corning Glass Works. Method of making photosensitive porous glass. 4,351,662, Cl. 65-30.100.

Elsas, Norman E., to Nemo Industries, Inc. Safety net for lavatory. 4,351,073, Cl. 4-654.000.

Elsner, Georg; Vollmer, Hartfrid; and Heymer, Gero, to Hoechst Aktiengesellschaft. Production of an isomeric mixture of secondary phosphines. 4,351,960, Cl. 568-8.000.

Elwert, Wolfram; and Forster, Gernot, to East Tradacons AG. Magazine for the protected storage of a set of drills. 4,351,435, Cl. 206-379.000.

Emerson Electric Co.: *See*—
McElroy, Jerry W., 4,351,200, Cl. 74-568.00T.

Emerson, James A.; Ramsey, James M.; and Buck, Kerry O., to Robinson Nugent, Inc. Adapting electrical connector. 4,351,582, Cl. 339-97.00R.

Engel, Gerhard: *See*—
Wessel, Wolf; and Engel, Gerhard, 4,352,032, Cl. 307-515.000.

Engelbart, Wilhelm, to Maskinfirma Certus AB. Jacket pressing apparatus. 4,351,457, Cl. 223-57.000.

Engineered Sports Products, Inc.: *See*—
Dalebout, Melvin W., 4,351,120, Cl. 36-117.000.

English, Edgar, Jr. Maximized strength-to-weight ratio panel material. 4,351,870, Cl. 428-174.000.

Enk, William A. Method and system for aircraft fire protection. 4,351,394, Cl. 169-61.000.

Entreprise d'Equipements Mecaniques et Hydrauliques, E.M.H.: *See*—
Tuson, Samuel; and Vilain, Robert, 4,351,260, Cl. 114-230.000.

Enyart, Charles E.; and Shoulis, John E., to Baxt Industries, Inc. Plastic panel mounting frame. 4,351,137, Cl. 52-202.000.

Erdos, William A., to Eagle Rubber Co., Inc. Riding toy for children with spring support base. 4,351,521, Cl. 272-52.000.

Ericksson, Leif, to Asea Aktiebolag. Impedance-measuring device for impedance protection. 4,352,136, Cl. 361-80.000.

Ernst, Margaret, executrix: *See*—
Ernst, Runyon G., deceased; Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., 4,351,705, Cl. 204-108.000.

Ernst, Runyon G., deceased; by Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., to Amax Inc. Refining copper-bearing material contaminated with nickel, antimony and/or tin. 4,351,705, Cl. 204-108.000.

Erpenbach, Heinz: *See*—
Kubbeler, Hans K.; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,351,972, Cl. 570-101.000.

Ersoy, Metin; and Weber, Albrecht, to Maschinenfabrik Hilma GmbH. Swing clamp. 4,351,516, Cl. 269-27.000.

Erth, Richard A.: *See*—
Kountz, Kenneth J.; and Erth, Richard A., 4,351,160, Cl. 62-201.000.

Eschenbach, Paul W., to Milliken Research Corporation. False twisted slub yarn. 4,351,148, Cl. 57-209.000.

Espe Fabrik Parmazeutischer Praparate G.m.b.H.: *See*—
Jochum, Peter; and Gasser, Oswald, 4,351,853, Cl. 427-2.000.

Espenscheid, Wilton F.: *See*—
Yan, Tsoung-yuan; and Espenscheid, Wilton F., 4,351,566, Cl. 299-5.000.

Etablissement Public de Diffusion dit "Telediffusion de France": *See*—
Guillou, Louis C., 4,352,011, Cl. 235-375.000.

Ethyl Corporation: *See*—
Thomas, Paul E.; and Raley, Garland E., 4,351,784, Cl. 264-22.000.

Evans, David M.; and Swanson, Roy T., to S&C Electric Company. High-voltage switchgear. 4,351,994, Cl. 200-153.0SC.

Evans, Jonathan L.; and Learmonth, William H., to Ferranti Limited. Trimming a circuit element layer of an electrical circuit assembly. 4,352,005, Cl. 219-121.0LJ.

Evans, Joseph H.: *See*—
Middleman, Lee M.; Evans, Joseph H.; Blake, Arthur E.; and Scheff, Victor A., 4,352,083, Cl. 338-23.000.

Exxon Research & Engineering Co.: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,351,945, Cl. 548-130.000.

Flory, John F.; and Woehleke, Steven P., 4,351,351, Cl. 137-68.00R.
Gorbaty, Martin L.; Stone, John B.; and Poddar, Syamal K., 4,351,716, Cl. 208-8.0LE.
Worley, Arthur C., 4,351,361, Cl. 137-625.440.

F. Jos. Lamb Company: *See*—
Brems, John H.; and Graham, James T., 4,351,241, Cl. 104-93.000.

Fahey, Dennis M.: *See*—
Das, Balbhadra; and Fahey, Dennis M., 4,351,752, Cl. 523-401.000.

Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., to American Home Products Corporation. N-Substituted cyclopeptide derivatives. 4,351,828, Cl. 424-177.000.

Fairchild Camera & Instrument Corp.: *See*—
Davis, T. Grant, 4,351,892, Cl. 430-30.000.
Matrone, John L., 4,352,061, Cl. 324-158.00F.
Radigan, Kenneth J., 4,351,696, Cl. 156-643.000.

Fajt, John; and Neal, James V., Jr., to Xenell Corporation. Automated lamp aging. 4,351,578, Cl. 316-1.000.

Falkowski, Leonard S.: *See*—
Stefanska, Barbara J.; Falkowski, Leonard S.; and Borowski, Edward, 4,351,937, Cl. 536-6.400.

Fanene, Bernard: *See*—
Floury, Claude P.; Guillet, Claude L. J. M.; Lokocki, James A.; Devoille, Maurice R.; and Fanene, Bernard, 4,351,468, Cl. 228-4.500.

Farkas, Peter E., to Szentkiralyi, Laszlo; and Csoke, Istvan, a part interest to each. Combo hand rake. 4,351,145, Cl. 56-400.160.

Farmitalia Carlo Erba Spa: *See*—
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,351,829, Cl. 424-177.000.

Farnstrom, Sven E.; and Andersson, Hans, to Minitube NYA AB. Thermometer guard. 4,351,616, Cl. 374-209.000.

Farrell, John J. Plastic end capping machine. 4,351,629, Cl. 425-116.000.

Fasco Industries, Inc.: *See*—
Barry, Leon G.; and Rieman, Willis E., 4,352,082, Cl. 337-409.000.

Fasig, Harold A.; and Paananen, Eugene E., to Burroughs Corporation. Track sensor controller. 4,352,013, Cl. 250-223.00R.

Faulkner, Ben V. Method of preventing drill string overflow. 4,351,400, Cl. 175-69.000.

Faure, Jean-Louis; and Vanhelle, Michel, to ASA S.A. Process and device for producing a yarn having alternate twists of opposite directions. 4,351,146, Cl. 57-6.000.

FBC Limited: *See*—
Harris, John F., 4,351,968, Cl. 568-763.000.

Fechalos, William A., to Wescom, Inc. Electronic telephones with cooperative interaction between a master set and members' sets in a group. 4,351,986, Cl. 179-27.0FH.

Federal Paper Board Co., Inc.: *See*—
Manizza, Guelfo A., 4,351,473, Cl. 229-43.000.

Fehr, Charles, to Firmenich SA. Polyunsaturated bicyclic compounds, their preparation and use of same as starting materials for preparing monounsaturated bicyclic compounds. 4,351,977, Cl. 585-22.000.

Fehrs, Hellmuth; and Elliesen, Wolfgang, to Joh.Friedrich Behrens AG. Compressed air-operated fastener driving tool with release safety means. 4,351,464, Cl. 227-7.000.

Feil, Thomas E., to V-Band Systems, Inc. Telephone line circuit hold arrangement. 4,351,987, Cl. 179-99.00H.

Felix, Raymond A., to Stauffer Chemical Company. Sulfinoate herbicidal antidotes. 4,351,665, Cl. 71-103.000.

Fellner, Peter J.; Hamill, Brendan J.; and Manley, Paul W., to G.D. Searle & Co. Imidazole hydrazone derivatives. 4,351,948, Cl. 548-336.000.

Felt Products Mfg. Co.: *See*—
McDowell, Donald J., 4,351,534, Cl. 277-235.00B.

Fenton, Edward A., Jr.; Lakin, Ira W.; and Blair, Gilbert, to Dravo Corporation. Heavy duty belt conveyor. 4,351,431, Cl. 198-823.000.

Ferb, Robert J.: *See*—
Biedell, Edward L.; and Ferb, Robert J., 4,351,804, Cl. 422-170.000.

Ferguson, Andrew C., to W. & T. Avery Limited. Weighing scales incorporating printers. 4,351,403, Cl. 177-2.000.

Ferm, Richard L.; and Latif, Chester C., to Chevron Research Company. Quick-setting bituminous emulsion compositions. 4,351,750, Cl. 524-8.000.

Fernandez Garvajosa, Jose M.: *See*—
LLorente Agudo, Nieves; Elia Miguel, Maria F.; Aranguren Escobar, Maria A.; Pares Olivet, Eulalia; and Fernandez Garvajosa, Jose M., 4,351,903, Cl. 435-234.000.

Ferranti Limited: *See*—
Evans, Jonathan L.; and Learmonth, William H., 4,352,005, Cl. 219-121.0LJ.

Fetty, Harold D.: *See*—
Roberts, Charles W.; Lindner, Daniel J.; Kwee, Henry T.; Kolowski, Michael A.; and Fetty, Harold D., 4,351,381, Cl. 152-209.00R.

Fiat Societa per Azioni: *See*—
Martinengo, PierCarlo; Giachello, Angelo; Tommasini, Giuseppe; and Popper, Paul, 4,351,787, Cl. 264-65.000.

Fiber Industries, Inc.: *See*—
Blackmon, Lawrence E.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,351,147, Cl. 57-208.000.

Fichtel & Sachs AG: *See*—
Steuer, Werner; and Leiter, Bernd, 4,351,569, Cl. 301-6.00V.

Fiebiger, Josef, to Gesipa Blindniettechnik Gesellschaft mit Beschrankter Haftung. Manual riveting tool. 4,351,179, Cl. 72-391.000.

Fielder, Coy M., to Christensen, Inc. Earth-boring drill bits. 4,351,401, Cl. 175-329.000.

Fields, Gerald M.; and Metzner, Robert G., to Hybricon Inc. Hybrid car with electric and heat engine. 4,351,405, Cl. 180-65.00A.

Fike Metal Products Corp.: *See*—
Tyree, Charles N., 4,351,393, Cl. 169-37.000.

Filidoro, Roberto; and Di Sciascio, Nicola, to Nuovo Pignone S.p.A. Balanced-spotter valve. 4,351,353, Cl. 137-219.000.

Finike Italiana Marposs, S.p.A.: *See*—
Possati, Mario, 4,351,115, Cl. 33-178.00D.

Finlayson, James E., III; Holder, Joseph P.; Holt, L. Earl; and Lee, Seung Y., to Burlington Industries, Inc. Process of reactively dyeing and printing toweling. 4,351,638, Cl. 8-463.000.

Firmenich SA: *See*—
Delay, Francois, 4,351,748, Cl. 252-522.00R.
Fehr, Charles, 4,351,977, Cl. 585-22.000.

Firth, John H. Radar reflectors. 4,352,106, Cl. 343-18.00C.

Fischer, Gunter, to Zahnradfabrik Friedrichshafen. Apparatus for the automatic shifting of a stepped speed-change transmission, especially for automotive vehicles. 4,351,205, Cl. 74-866.000.

Fischer, Nathan A.: *See*—
Leining, Lyndon R.; Fischer, Nathan A.; Simonson, Kent L.; White, Gordon G.; and Lindstrom, Oscar H., 4,351,088, Cl. 17-50.000.

Fitzgerald, John B.: *See*—
McNairy, James A.; and Fitzgerald, John B., 4,351,151, Cl. 60-290.000.

Fitzpatrick Associates, Inc.: *See*—
Fitzpatrick, John R., 4,351,079, Cl. 15-104.06A.

Fitzpatrick, John R., to Fitzpatrick Associates, Inc. Sphere launching and receiving valve. 4,351,079, Cl. 15-104.06A.

Flamm, Peter M., to ITT Industries, Inc. Color-television receiver having integrated circuit for the luminance signal and the chrominance signals. 4,352,123, Cl. 358-23.000.

Flaum, Stephen S.; and Leff, Martin J., to S&S Corrugated Paper Machinery Co., Inc. Adhesive metering device. 4,351,264, Cl. 118-203.000.

Fleetwood Systems, Inc.: *See*—
Mojden, Wallace W., 4,351,430, Cl. 198-690.000.

Fleischmann, Herbert: *See*—
Keppel, Heinrich; Klapper, Peter; and Fleischmann, Herbert, 4,351,998, Cl. 219-10.55R.

Flemming, Michael A.: *See*—
Stephen, James H.; McCann, John D.; and Flemming, Michael A., 4,352,098, Cl. 340-572.000.

Flexiwatt Corporation: *See*—
Widmayer, Don F., 4,352,045, Cl. 315-291.000.

Flock, John W., to General Electric Company. Phenol recovery from bisphenol-A waste streams. 4,351,966, Cl. 568-753.000.

Flory, John F.; and Woehleke, Steven P., to Exxon Research and Engineering Co. Breakaway pipe coupling with automatically closed valves. 4,351,351, Cl. 137-68.00R.

Floury, Claude P.; Guillet, Claude L. J. M.; Lokocki, James A.; Devoille, Maurice R.; and Fanene, Bernard, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. Apparatus for wiring connections on a substrate. 4,351,468, Cl. 228-4.500.

Foa, Marco; Moro, Alessandro; Gardano, Andrea; and Cassar, Luigi, to Montedison S.p.A. Process for preparing phenyl pyruvic acids. 4,351,952, Cl. 562-406.000.

Focke and Company: *See*—
Focke, Heinz H.; Liedtke, Kurt; and Bretthauer, Hans J., 4,351,142, Cl. 53-575.000.

Focke, Heinz H.; Liedtke, Kurt; and Bretthauer, Hans J., to Focke and Company. Apparatus for wrapping objects, in particular groups of cigarettes. 4,351,142, Cl. 53-575.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Safety belt roll-up device. 4,351,496, Cl. 242-107.40A.

Foley, Daniel J.: *See*—
Reynolds, Richard W.; Myers, Allen; and Foley, Daniel J., 4,351,152, Cl. 60-395.000.

Folk, Kenneth F., to AMP Incorporated. Apparatus for terminating ribbon cable. 4,351,110, Cl. 29-749.000.

Foltuz, Eugene L.: *See*—
Hayberg, Robert S.; and Foltuz, Eugene L., 4,351,630, Cl. 425-517.000.

Fontana, Frank J., to Stewart-Warner Corporation. Soft tread caster wheel and method of making same. 4,351,084, Cl. 16-45.000.

Ford Motor Company: *See*—
Lemieux, George E.; and Tibbles, Tom T., 4,351,206, Cl. 74-866.000.

Forney Engineering Company: *See*—
Slater, Billy R., 4,352,103, Cl. 340-825.010.

Forrester, Bobby G.: *See*—
Keehner, James E.; Linn, Samuel A.; Kahut, Marvin L.; Forrester, Bobby G.; and Bohanan, Roy E., 4,351,234, Cl. 101-10.000.

Forsberg, Georg L. K. Device with screw conveyor for discharging bulk material. 4,351,627, Cl. 414-312.000.

Forssell, Ake: *See*—
Selestam, Berndt; Forssell, Ake; and Winnersjo, Per A., 4,351,625, Cl. 405-303.000.

Forster, Gernot: *See*—
Elwert, Wolfram; and Forster, Gernot, 4,351,435, Cl. 206-379.000.

Fortcamp, James A.: *See*—
Verderber, Joseph A.; Fortcamp, James A.; McInturff, Ace; and Rose, Denis A., 4,352,012, Cl. 235-487.000.

Foulks, Alan L.; and Larson, Gary O., to Sperry Corporation. Single cue drive for flight director indicator. 4,351,187, Cl. 73-178.00R.

Fournier, Rene: *See—*
Plantard, Dominique; Langlais, Gerard; and Fournier, Rene, 4,351,660, Cl. 65-5.000.

Fox, Daniel W., to General Electric Company. Foamable polyester composition. 4,351,911, Cl. 521-138.000.

Foxboro Company, The: *See—*
Amey, Guy C., 4,351,385, Cl. 165-61.000.

Foye, Duane F.: *See—*
Gibbs, Dale S.; and Foye, Duane F., 4,351,929, Cl. 526-80.000.

Franchetti, Ilario: *See—*
Rovetta, Alberto; Franchetti, Ilario; and Vicentini, Pietro, 4,351,553, Cl. 294-106.000.

Frandsen, Aksel S. Device for flushing and aerating a surface coated with microorganisms in a plant for biological purification of waste water. 4,351,721, Cl. 210-150.000.

Franke, Walter. Internal combustion engine and intermediate flange member for such an engine. 4,351,298, Cl. 123-432.000.

Franko, Eugene B., to Xerox Corporation. Variable magnification optical system for use in electrophotographic printing. 4,351,606, Cl. 355-14.00R.

Franz, James H., Jr., to Westinghouse Electric Corp. Brake control apparatus and method. 4,352,049, Cl. 318-370.000.

Frech, John W.; and Au, Lonnie C., to United States of America, Air Force. Statistical method of measuring the differential linearity of an analog/digital converter using a pseudo-random triangle wave stimulus. 4,352,160, Cl. 364-553.000.

Freller, Walter. Length-adjustable structural unit. 4,351,135, Cl. 52-67.000.

French, Tom: *See—*
Corner, Michael R.; Kemp, Ian; and French, Tom, 4,351,382, Cl. 152-330.0RF.

Friedli, Hans R.: *See—*
Correll, Glenn D.; and Friedli, Hans R., 4,351,812, Cl. 423-243.000.

Frielinghaus, Klaus H., to General Signal Corporation. Track circuit principle wheel detector. 4,351,504, Cl. 246-249.000.

Frister, Manfred: *See—*
Grozinger, Alfred; Frister, Manfred; and Kreuzer, Helmut, 4,351,102, Cl. 29-596.000.

Fritz Eichenauer, Firma: *See—*
Hofer, Edwin; and Ohnmacht, Helmut, 4,352,008, Cl. 219-540.000.

Frost, Albert C.; and Yang, Chang-lee, to Union Carbide Corporation. Cyclic process for producing methane from carbon monoxide with heat removal. 4,351,646, Cl. 48-197.00R.

Fuji Photo Film Co., Ltd.: *See—*
Aoki, Kozo; Seto, Nobuo; Yabuki, Yoshiharu; Morigaki, Masakazu; Furutachi, Nobuo; and Nakamura, Kotaro, 4,351,897, Cl. 430-555.000.
Fukushima, Osamu; Akisada, Masahide; Monma, Yoshiyuki; and Kitamura, Kazuaki, 4,352,198, Cl. 378-185.000.

Fujino, Hiroko: *See—*
Muroi, Kaname; and Fujino, Hiroko, 4,351,744, Cl. 252-408.000.

Fujishima, Kunihiro; and Kuramoto, Takaki, to Sanyo Electric Co., Ltd. Induction heating cooking apparatus. 4,352,000, Cl. 219-10.770.

Fujita, Masao: *See—*
Tuchiya, Yoshimasa; Ishii, Katsumi; Iidaka, Toshiharu; and Fujita, Masao, 4,351,561, Cl. 296-216.000.

Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, to Sumitomo Chemical Company, Limited. Process for the production of compounds having in the molecule at least one β-sulfatoethyl-sulfone group and at least one sulfonic acid group. 4,351,765, Cl. 260-163.000.

Fujitsu Fanuc Limited: *See—*
Sakano, Tetsurou, 4,352,050, Cl. 318-661.000.

Fujitsu Limited: *See—*
Oguchi, Takuro; Ohsawa, Zenichi; and Murai, Shinichi, 4,352,053, Cl. 323-220.000.

Fujiwara, Yasuo; Maeo, Hidemi; and Muramoto, Eiichi, to Kabushiki Kaisha Komatsu Seisakusho. Track roller suspension apparatus for a track-type vehicle. 4,351,572, Cl. 305-27.000.

Fukui, Shosin; and Shinjo, Masayoshi, to Daikin Kogyo Co., Ltd. Prevention of adhesion of epoxy resins. 4,351,880, Cl. 428-378.000.

Fukunaga, Koichi, to Toyota Jodosha Kogyo Kabushiki Kaisha. Gear box breather plug assembly. 4,351,203, Cl. 74-606.00R.

Fukushima, Madoka; Akita, Kin-ichiro; and Masuda, Yoshihisa, to Radio Research Laboratories, Ministry of Posts and Telecommunications. Method and apparatus for remote measurement of wind direction and speed in the atmosphere. 4,351,188, Cl. 73-189.000.

Fukushima, Osamu; Akisada, Masahide; Monma, Yoshiyuki; and Kitamura, Kazuaki, to Fuji Photo Film Co., Ltd. X-Ray photography cassette. 4,352,198, Cl. 378-185.000.

Fuller, Francis M., to Raymond International Builders, Inc. Ground anchor installation. 4,351,136, Cl. 52-155.000.

Fuller, Stuart C., to Kerr Glass Manufacturing Corp. Label positioner. 4,351,693, Cl. 156-556.000.

Fuller, William D.: *See—*
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,351,762, Cl. 260-112.50R.

Furukawa, Yuji; and Sato, Makoto, to Makino Milling Machine Co., Ltd. Load-compensated type guide mechanism adapted for a machine. 4,351,574, Cl. 308-3.00A.

Furutachi, Nobuo: *See—*
Aoki, Kozo; Seto, Nobuo; Yabuki, Yoshiharu; Morigaki, Masakazu; Furutachi, Nobuo; and Nakamura, Kotaro, 4,351,897, Cl. 430-555.000.

G.D. Searle & Co.: *See—*
Fellner, Peter J.; Hamill, Brendan J.; and Manley, Paul W., 4,351,948, Cl. 548-336.000.

Gaafar, Hassan A., to Research Corporation. Purified antigen to test for *Neisseria gonorrhoeae* antibodies. 4,351,761, Cl. 260-112.00R.

Gabbay, Emile, to Compagnie Generale de Radiologie. X-Ray tube for producing a flat wide-angle fan-shaped beam of X-rays. 4,352,196, Cl. 378-125.000.

GAF Corporation: *See—*
Davis, Duane A., 4,351,873, Cl. 428-198.000.

Gaidis, James M.: *See—*
Rosenberg, Arnold M.; Gaidis, James M.; and Kindt, Lawrence J., 4,351,671, Cl. 106-90.000.

Gaines, Marvin E.: *See—*
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,351,227, Cl. 92-71.000.

Galaske, Folker: *See—*
Duke, Douglas; Drodofsky, Reinhold; and Galaske, Folker, 4,351,619, Cl. 400-196.100.

Galloway, Terry R., to United States of America, Energy. Catalytic cartridge SO_3 decomposer. 4,351,806, Cl. 422-206.000.

Gander, Peter, to Armex AG. Connecting element for concrete or reinforced concrete structural members that are to be cast one after the other. 4,351,139, Cl. 52-378.000.

Ganrot, Bertil: *See—*
Mattisson, Lennart; and Ganrot, Bertil, 4,351,997, Cl. 219-10.55E.

Garcia, Vilma A., to Magnaflux Corporation. High temperature penetrant system. 4,351,185, Cl. 73-104.000.

Gardano, Andrea: *See—*
Foa, Marco; Moro, Alessandro; Gardano, Andrea; and Cassar, Luigi, 4,351,952, Cl. 562-406.000.

Garner, Henry C.; and Broadbent, Jack, to British Steel Corporation. Surface inspection equipment. 4,351,184, Cl. 73-104.000.

Garnier, John J., to Eaton Corporation. Method of and apparatus for continually monitoring the heating value of a fuel gas using a combustibility meter. 4,351,614, Cl. 374-37.000.

Garpendahl, Gunnar; Bruce, Ingrid; and Lundmark, Ebbe, to Viak AB. Apparatus for measuring the interior dimensions of a cast iron mold. 4,352,060, Cl. 324-61.00R.

Garrett, Wayne; and Neuman, Richard F., to Eaton Corporation. Automatic slack adjuster. 4,351,419, Cl. 188-71.900.

Garrigues, Jean-Claude, to Applications Mecanique et Robinetterie Industrielle, A.M.R.I. Sealing gasket for an obturator such as a ventilation regulator. 4,351,511, Cl. 251-174.000.

Gartside, Robert J.: *See—*
Bhojwani, Arju H.; Gartside, Robert J.; and Woebcke, Herman N., 4,351,275, Cl. 122-7.00R.

Garvey Corporation: *See—*
Garvey, Francis J., 4,351,429, Cl. 198-688.000.

Garvey, Francis J., to Garvey Corporation. Conveyor with slip cleats. 4,351,429, Cl. 198-688.000.

Gaschler, Erich; and Schwarz, Cornelia, to Volkswagenwerk AG. Drive aggregate for a heat pump. 4,351,278, Cl. 123-195.00R.

Gasioli, Joseph L., to White Consolidated Industries, Inc. Oven door latch. 4,351,288, Cl. 126-197.000.

Gasser, Oswald: *See—*
Jochum, Peter; and Gasser, Oswald, 4,351,853, Cl. 427-2.000.

Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Preparation of carboxylic acids by carbonylation of alcohols. 4,351,953, Cl. 562-519.000.

Geary, Carl H.; and Samurin, Norman A., to Carrier Corporation. Expander-generator control system. 4,352,024, Cl. 290-52.000.

Gehrmann, Klaus: *See—*
Kubbeler, Hans K.; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,351,972, Cl. 570-101.000.

Geiger, Istvan; Theuerkauf, Heinz; and Stamm, Klaus, to Volkswagenwerk Aktiengesellschaft. Method and system for operation of a spark-ignited internal combustion engine. 4,351,281, Cl. 123-425.000.

Geigert, John: *See—*
Neidleman, Saul L.; Amon, William F., Jr.; and Geigert, John, 4,351,902, Cl. 435-137.000.

Gelman Sciences, Inc.: *See—*
Ambler, Jeffrey, 4,351,711, Cl. 204-180.00G.

General Battery Corporation: *See—*
Eberle, William J., 4,352,002, Cl. 219-78.150.
Oxenreider, Terry, 4,351,890, Cl. 429-179.000.

General Dynamics: *See—*
Maudal, Inge; Wedertz, Larry D.; and Yost, Kenneth M., 4,351,499, Cl. 244-3.270.

General Dynamics Corporation: *See—*
Weiss, Olin E.; Davis, Grant L.; Hudson, James L.; and Dowell, Harlan T., 4,351,688, Cl. 156-358.000.

General Electric Company: *See—*
Brunelle, Daniel J., 4,351,718, Cl. 208-262.000.
Crouch, Donald W., 4,351,992, Cl. 200-144.00B.
Flock, John W., 4,351,966, Cl. 568-753.000.
Fox, Daniel W., 4,351,911, Cl. 521-138.000.
Ingersoll, Brian E.; Nicholson, Ross C.; and Dennisson, James W., 4,351,448, Cl. 220-318.000.
Johnson, John H., 4,352,051, Cl. 318-790.000.
Karhan, Barry L.; and Archibald, James B., 4,352,034, Cl. 310-59.000.
Mulvey, Robert F.; and Crepeau, Charles E., 4,351,867, Cl. 428-70.000.
Poling, Ronald W., 4,351,105, Cl. 29-622.000.
Puckette, Charles M., 4,352,210, Cl. 455-317.000.

Rodenbeck, Philip G., 4,351,103, Cl. 29-596.000.
Schulze, Wallace M., 4,351,150, Cl. 60-226.00R.
Schumacher, Frank A., 4,351,159, Cl. 62-79.000.
Sivertsen, Marvin L.; and Sobolewski, Valentine S., 4,351,124, Cl. 40-158.00B.

General Electric Company Limited, The: *See*—
Johns, Allan T., 4,352,137, Cl. 361-82.000.
Rigden, Sydney A. R., 4,352,043, Cl. 315-1.000.

General Foods Corporation: *See*—
Keehner, James E.; Linn, Samuel A.; Kahut, Marvin L.; Forrester, Bobby G.; and Bohanan, Roy E., 4,351,234, Cl. 101-10.000.
Oldershaw, C. G. Peter, 4,351,374, Cl. 141-71.000.

General Motors Corporation: *See*—
Ament, Frank, 4,351,283, Cl. 123-458.000.
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,351,227, Cl. 92-71.000.
Luckman, James E.; Winstead, William P.; and Kastura, John L., 4,351,306, Cl. 123-609.000.
Malik, Marvin J., 4,351,409, Cl. 180-165.000.
McCartney, Charles P., Jr.; and Wheadon, Ellis G., 4,351,891, Cl. 429-225.000.
Schultz, Raymond J.; and Marr, Michael E., 4,351,228, Cl. 92-128.000.
Summerfield, James D., 4,351,450, Cl. 220-319.000.

General Signal Corporation: *See*—
Frielinghaus, Klaus H., 4,351,504, Cl. 246-249.000.

Geo. A. Hormel & Company: *See*—
Leining, Lyndon R.; Fischer, Nathan A.; Simonson, Kent L.; White, Gordon G.; and Lindstrom, Oscar H., 4,351,088, Cl. 17-50.000.

George, Mark S., to Hobart Corporation. Label printer system. 4,351,690, Cl. 156-384.000.

Gerber Scientific Instrument Company, The: *See*—
Hevenor, Charles M., Jr., 4,352,165, Cl. 364-900.000.

Gereg, Gordon A. Endotracheal tube holder and bite block. 4,351,331, Cl. 128-207.170.

Gerlack, Richard Z., to Varian Associates, Inc. Ridged waveguide window assembly. 4,352,077, Cl. 333-252.000.

Germann, Willy, to BBC Brown, Boveri & Company, Ltd. Apparatus for compressing winding elements in an electric machine. 4,351,107, Cl. 29-736.000.

Gervais, Yvon; Gillet, Renen; and Tanis, Georges, to Commissariat a l'Energie Atomique. Joining process. 4,352,004, Cl. 219-121.0ED.

Geselchen, Paul D.; and Shuman, Robert T., to Eli Lilly and Company. Pharmacologically active peptides. 4,351,763, Cl. 260-112.50E.

Gesipa Blindniettechnik Gesellschaft mit Beschrankter Haftung: *See*—
Fiebiger, Josef, 4,351,179, Cl. 72-391.000.

Gessner, Dieter; and Ott, Lothar, to tpT Machinery Corporation. Transfer device for parisons and finished products in injection blow molding devices. 4,351,631, Cl. 425-533.000.

Giachello, Angelo: *See*—
Martinengo, PierCarlo; Giachello, Angelo; Tommasini, Giuseppe; and Popper, Paul, 4,351,787, Cl. 264-65.000.

Giannakidis, Dimitrios, to Standard Products Company, The. Molding having encapsulated metallized film. 4,351,864, Cl. 428-31.000.

Gibbons, Ralph D.; and Shackleford, Geoffrey G., to Lansing Bagnall Limited. Pneumatically operated applicator and method of applying adhesive tape. 4,351,684, Cl. 156-215.000.

Gibbs, Dale S.; and Foye, Duane F., to Dow Chemical Company, The. Crystallizable controlled composition interpolymers of vinylidene chloride and methyl methacrylate and method of preparing same. 4,351,929, Cl. 526-80.000.

Gibbs, John D.: *See*—
Cormier, Raymond G.; and Gibbs, John D., 4,351,601, Cl. 355-3.0SH.

Giddings, Edward H. Fluidic diode combustion chamber. 4,351,294, Cl. 123-291.000.

Giggard, Earl D.; Khoury, Nick S.; Kowalik, John J.; and Terrien, Donald R., to Continental Group, Inc., The. Bail hangers for paint cans and the like. 4,351,445, Cl. 220-91.000.

Gilker, Clyde, to McGraw-Edison Company. Backup trip circuit for a circuit breaker. 4,352,138, Cl. 361-92.000.

Gillet, Renen: *See*—
Gervais, Yvon; Gillet, Renen; and Tanis, Georges, 4,352,004, Cl. 219-121.0ED.

Gillingham, Gary R., to Donaldson Company, Inc. Cowl-like scrubber for a long-wall shearer. 4,351,567, Cl. 299-45.000.

Gilmore, Cecilia: *See*—
Rule, Charles E.; Gilmore, Cecilia; and Stefanski, Eugene J., 4,351,852, Cl. 426-554.000.

Giolito, Silvio L.; and Mirviss, Stanley B., to Stauffer Chemical Company. Process for preparing isopropylphenyl/phenyl phosphate. 4,351,780, Cl. 260-974.000.

Gist-Brocades N.V.: *See*—
Bijlenga, Gosse, 4,351,827, Cl. 424-89.000.

Gladwin Corporation: *See*—
Gladwin, Floyd R., deceased, 4,351,383, Cl. 164-448.000.

Gladwin, Floyd R., deceased (by Gladwin, Yvonne J., executrix), to Gladwin Corporation. Bearings for continuous casting roller aprons. 4,351,383, Cl. 164-448.000.

Gladwin, Yvonne J., executrix: *See*—
Gladwin, Floyd R., deceased, 4,351,383, Cl. 164-448.000.

Glass, Henry: *See*—
Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry, 4,351,165, Cl. 62-371.000.

Glasstetter, Fred E.; and Eckert, Frank J., to Columbian Chemicals Company. Battery carbon black. 4,351,815, Cl. 423-445.000.

Glaxo Laboratories Limited: *See*—
Coles, Richard J., 4,351,842, Cl. 424-274.000.

Glazov, Vladimir G.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Glebov, Igor A.: *See*—
Antonov, Jury P.; Glebov, Igor A.; and Shakhtarin, Valentin N., 4,352,033, Cl. 310-52.000.

Global Precision Inc.: *See*—
Hayberg, Robert S.; and Foltuz, Eugene L., 4,351,630, Cl. 425-517.000.

Glorfield, Paul H.; Bryant, Spencer L.; and Kirklin, Vance L., to J. R. Simplot Company. Carton filling system. 4,351,141, Cl. 53-473.000.

Goetz, Philip J. Method of obtaining the mean electrophoretic mobility of particles. 4,351,709, Cl. 204-180.00R.

Goldberg, Edward M.; and Bazell, Seymour, to UreSil Company. Balloon catheter. 4,351,341, Cl. 128-348.000.

Goldberg, Richard J. Mixed grain single emulsion layer photographic material. 4,351,898, Cl. 430-571.000.

Golze, Richard R. Ski/float landing gear apparatus for aircraft. 4,351,500, Cl. 244-105.000.

Gomes, Daniel. Swing. 4,351,524, Cl. 272-85.000.

Gonzalez, Eduardo B. Body structure and nozzle for enhancing the flow of drilling fluid in a rotary drill bit. 4,351,402, Cl. 175-340.000.

Goodin, Richard D.: *See*—
Baizer, Manuel M.; and Goodin, Richard D., 4,351,951, Cl. 560-186.000.

Goodkin, Richard P. Method of preserving corpses. 4,351,091, Cl. 27-22.00R.

Goodman, Murray: *See*—
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,351,762, Cl. 260-112.50R.

Goodrich, David G., to Kaiser Aluminum & Chemical Corporation. Coolant control in EM casting. 4,351,384, Cl. 164-468.000.

Goodyear Tire & Rubber Company, The: *See*—
Cohn, Alan E., 4,351,548, Cl. 283-21.000.
Pilliod, Charles J., Jr.; and Payne, Roger E., 4,351,380, Cl. 152-169.000.
Roberts, Charles W.; Lindner, Daniel J.; Kwee, Henry T.; Kolowski, Michael A.; and Fetty, Harold D., 4,351,381, Cl. 152-209.00R.
Watts, George T., 4,351,865, Cl. 428-36.000.

Gorbaty, Martin L.; Stone, John B.; and Poddar, Syamal K., to Exxon Research & Engineering Co. Liquefaction process. 4,351,716, Cl. 208-8.0LE.

Gottsegen, Marten; Drucker, Fred F.; and Glass, Henry. Portable cooler. 4,351,165, Cl. 62-371.000.

Gotz, Manfred K.: *See*—
Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., 4,351,828, Cl. 424-177.000.

Govindaraju, Kuppusami, to Instruments S.A. Method for concentrating a low-concentration element in a solution. 4,351,643, Cl. 23-230.0EP.

Gradeff, Peter S.; and Murayama, Stanley T., to Rhone Poulenc Inc. Process for the preparation of hydroxy benzene carboxaldehydes. 4,351,962, Cl. 568-432.000.

Graf, Rudolf, to Sprecher & Schuh AG. Gas-blast switch. 4,351,993, Cl. 200-148.00A.

Graff, Stewart M. Reusable resiliently distortable sheet plastic closure for application to rimmed containers. 4,351,447, Cl. 220-306.000.

Graham, James T.: *See*—
Brems, John H.; and Graham, James T., 4,351,241, Cl. 104-93.000.

Granger, Harold M.: *See*—
Elias, William H.; and Granger, Harold M., 4,352,147, Cl. 361-433.000.

Grant, Patrick T.: *See*—
Blair, Albert; and Grant, Patrick T., 4,351,268, Cl. 119-3.000.

Graves, William B.; and Walsh, James F., to EECO Incorporated. Variable resistor disk assembly. 4,352,084, Cl. 338-127.000.

Gray, John O.; and Sanderson, Michael L., to National Research Development Corporation. Differential flowmeters. 4,351,189, Cl. 73-196.000.

Grice, Harold E. Lightweight concrete and method of making same. 4,351,670, Cl. 106-88.000.

Griffith, Glen A., to Hughes Aircraft Company. rf Pumped waveguide laser with inductive loading for enhancing discharge uniformity. 4,352,188, Cl. 372-82.000.

Griffith, James R.: *See*—
Keller, Teddy M.; and Griffith, James R., 4,351,776, Cl. 260-465.00G.

Griffith, Ronald C.; and Kinsolving, Clyde R., to Pennwalt Corporation. Antiviral alpha, alpha-dialkyl adamantylethylamines. 4,351,847, Cl. 424-325.000.

Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,351,886, Cl. 428-591.000.

Grosbois, Jean: *See*—
Boudot, Bernard; Grosbois, Jean; and Pajot, Michel, 4,351,821, Cl. 423-624.000.

Gross, Valery N.; Kozhanov, Evgeny V.; Stupnik, Vyacheslav D.; and Valov, Vladimir V. Micrometering liquid sample dispenser. 4,351,799, Cl. 422-63.000.

Grossman, Milton. Toothbrush with curved bristles and handle. 4,351,080, Cl. 15-167.00R.

Grove, Edward E.: *See—*
Ryan, Jerry E.; and Grove, Edward E., 4,351,277, Cl. 122-390.000.

Growdon, John H.; and Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating disorders by administering isoxsurpine and choline. 4,351,831, Cl. 424-199.000.

Grozinger, Alfred; Frister, Manfred; and Kreuzer, Helmut, to Robert Bosch GmbH. Method for winding the stator in a three phase AC machine. 4,351,102, Cl. 29-596.000.

Grunsch, Eckhardt; and Wochele, Gunter, to Licentia Patent-Verwaltungs-G.m.b.H. Method for actuating a switching transistor operating as a setting member in a DC/DC converter. 4,352,054, Cl. 323-224.000.

GTE Laboratories Incorporated: *See—*
Dampier, Frederick W.; and Kalivas, Risty T., 4,351,888, Cl. 429-62.000.

GTE Products Corporation: *See—*
Belttary, Harold E., 4,351,583, Cl. 339-259.00R.

Guarnaschelli, Stephen. Heat exchanger apparatus. 4,351,389, Cl. 165-141.000.

Guhde, Donald J., to ROHCO, Inc. Conversion coatings for zinc and cadmium surfaces. 4,351,675, Cl. 148-6.15R.

Guillet, Claude L. J. M.: *See—*
Floury, Claude P.; Guillet, Claude L. J. M.; Lokocki, James A.; Devoille, Maurice R.; and Fanene, Bernard, 4,351,468, Cl. 228-4.500.

Guillou, Louis C., to Etablissement Public de Diffusion dit "Telediffusion de France"; and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre Nationale d'Etudes des Telecommunications). Subscription card for a videotex receiver. 4,352,011, Cl. 235-375.000.

Guth, Friedrich, to Texas Instruments Deutschland GmbH. Recognition apparatus. 4,352,125, Cl. 358-101.000.

Gutierrez, Antonio: *See—*
Brois, Stanley J.; and Gutierrez, Antonio, 4,351,945, Cl. 548-130.000.

Guy, David A.; and Nims, Philip A., to Crompton & Knowles Corporation. Yarn brake for a textile machine. 4,351,370, Cl. 139-450.000.

Gyi, Koko, to Data Master. Floppy disc drive. 4,352,132, Cl. 360-97.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Variable speed constant frequency power converter with two modes of operation. 4,352,155, Cl. 363-163.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. AC to AC Power converter with a controllable power factor. 4,352,156, Cl. 363-163.000.

Haberli, Peter, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method of manufacturing a sabot projectile and sabot projectile produced thereby. 4,351,094, Cl. 29-1.200.

Hachino, Hiroaki: *See—*
Kurihara, Yasutoshi; Hachino, Hiroaki; and Nakamura, Kousuke, 4,352,120, Cl. 357-81.000.
Mochizuki, Yasuhiro; Wakui, Yoko; and Hachino, Hiroaki, 4,351,677, Cl. 148-188.000.

Hageman, Hendrik J.: *See—*
Reesink, Johan B.; Hageman, Hendrik J.; and Wiersum, Ulfert E., 4,351,935, Cl. 528-242.000.

Hager, Clarence H. Belt tensioning device. 4,351,636, Cl. 474-135.000.

Hager, Horst, to Nixdorf Computer AG. Magnetic disc memory. 4,352,133, Cl. 360-106.000.

Hagood, Jerry W.; and Norman, Ralph L., to United States of America, Army. Sonic transducer. 4,352,039, Cl. 310-328.000.

Hale Fire Pump Company: *See—*
Eberhardt, H. Alfred, 4,351,391, Cl. 165-154.000.

Halilovic, Esref; and Radisic, Branko. Photoactive ionization high-tension pulsator of carburetor motor ignition system. 4,351,308, Cl. 123-627.000.

Haller, Jack R.; and Haselton, William M., to Murray Machinery, Inc. Knife assembly for chopping apparatus. 4,351,487, Cl. 241-92.000.

Halliburton Company: *See—*
Lawson, Michael B., 4,351,673, Cl. 134-3.000.

Hamada, Keiichi: *See—*
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, 4,351,576, Cl. 308-37.000.

Hamamatsu TV Co., Ltd.: *See—*
Tsuchiya, Yutaka, 4,352,127, Cl. 358-217.000.

Hamann, Walter. Anti-theft system for valuable transport. 4,352,097, Cl. 340-571.000.

Hamel, Daniel L. Log splitter. 4,351,377, Cl. 144-193.00A.

Hamill, Brendan J.: *See—*
Fellner, Peter J.; Hamill, Brendan J.; and Manley, Paul W., 4,351,948, Cl. 548-336.000.

Hamm, Russell O. Electronic pitch detection for musical instruments. 4,351,216, Cl. 84-1.150.

Han Baek Trading Co., Ltd.: *See—*
Chung, Ha D., 4,351,451, Cl. 220-420.000.

Hanke, Wolfgang; and Schmitt, Manfred, to Voith Getriebe KG. Elastic coupling of disc construction. 4,351,167, Cl. 464-24.000.

Hanlon, Richard J.: *See—*
Kirkman, Michael; Rydwansky, Frank C., Jr.; Hanlon, Richard J.; and Petersen, Richard W., 4,351,580, Cl. 339-17.0CF.

Hanna, Glenn W. Method for repairing and reinforcing cast iron molds. 4,351,098, Cl. 29-402.150.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Hand and foot controlled throttle. 4,351,198, Cl. 74-482.000.

Harada Industry Co., Ltd.: *See—*
Kiyooka, Hisamaro, 4,352,107, Cl. 343-715.000.

Hard, Robert A.: *See—*
Megy, Joseph A.; and Hard, Robert A., 4,351,809, Cl. 423-167.000.
Megy, Joseph A.; and Hard, Robert A., 4,351,813, Cl. 423-304.000.

Hardman, Charles A. Reusable plugging dam for bowling balls. 4,351,508, Cl. 249-90.000.

Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda. Shredding machines. 4,351,485, Cl. 241-36.000.

Harney, Robert C., to Radiation Dynamics, Inc. Display system. 4,352,105, Cl. 343-5.0CD.

Harper, James M. E.: *See—*
Cuomo, Jerome J.; and Harper, James M. E., 4,351,712, Cl. 204-192.0EC.

Harper-Tervet, Jan; Dowler, Warren L.; Yen, Shiao-Ping S.; and Mueller, William A., to United States of America, National Aeronautics & Space Administration. Coating for gasifiable carbon-graphite fibers. 4,351,878, Cl. 428-367.000.

Harpold, Charles W. Method for screen printing. 4,351,238, Cl. 101-128.400.

Harrington, Timothy A., to Rockwell International Corporation. Feedforward amplifier with enhanced stability into loads with high VSWR. 4,352,072, Cl. 330-149.000.

Harris, John F., to FBC Limited. Production of organic compounds. 4,351,968, Cl. 568-763.000.

Harris, Peter: *See—*
Baylis, Michael A.; Harris, Peter; and Massey, Stewart R., 4,351,802, Cl. 422-89.000.

Harris, Steven L.: *See—*
Cave, David L.; Harris, Steven L.; and Zobel, Don W., 4,352,056, Cl. 323-314.000.

Harshaw Chemical Company, The: *See—*
Vogt, John W., 4,351,741, Cl. 252-313.00R.

Hart, Robert J. Method of grinding magnesium ingots and such ingots. 4,351,484, Cl. 241-30.000.

Hartmann, Ferdinand, to Austria Email Aktiengesellschaft. Process for enameling the inside surface of hollow vessels. 4,351,859, Cl. 427-232.000.

Hasegawa, Akira: *See—*
Kishida, Kazuo; Hasegawa, Akira; and Kawachi, Yasunori, 4,351,921, Cl. 525-80.000.

Hasegawa, Hiroshi; and Maida, Osamu, to Nippon Kogaku K. K. Flash output control failure warning device of an automatic flash output control speed light. 4,351,600, Cl. 354-60.00L.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Method of reeling and unreeling a reinforced veneer sheet. 4,351,379, Cl. 144-365.000.

Hasegawa, Tsunao; and Ohtake, Yasushi, to Pioneer Electronic Corporation. Magnetic sound recorder having computer-controlled adjusting device. 4,352,130, Cl. 360-66.000.

Haselton, William M.: *See—*
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Hashimoto, Akihiro, to Nissan Motor Company, Limited. Foldable panel for an automotive vehicle. 4,351,555, Cl. 296-37.160.

Hashimoto, Seiichi; and Aoki, Takaaki. Hydraulic pliers for snap rings. 4,351,097, Cl. 29-229.000.

Hashimoto, Yoshikazu. Dilute standard gases prepared by utilizing buffered solution, method for preparation thereof and apparatus therefor. 4,351,743, Cl. 252-408.000.

Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, to Chubu Electric Power Co., Inc., The; Chugoku Electric Power Co., Inc., The; Tokyo Electric Power Co., Inc., The; and Hitachi, Ltd. Method of locating sound generation within enclosure. 4,352,167, Cl. 367-127.000.

Hasspacher, Klaus, to Sandoz Ltd. Indane derivatives, process for their preparation, their use as pharmaceuticals and pharmaceutical compositions containing said derivatives. 4,351,838, Cl. 424-267.000.

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Hatashita, Hiroshi: *See—*
Saitoh, Takeshi; Hatashita, Hiroshi; Nagashima, Toshio; and Yamamoto, Susumu, 4,352,076, Cl. 333-204.000.

Hattori, Takemi, to Aisin Seiki Kabushiki Kaisha. Headrest for vehicles. 4,351,563, Cl. 297-408.000.

Hattori, Yoshihumi: *See—*
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.

Haug, Gerhard; and Siegel, Heinz, to Robert Bosch GmbH. Hydropneumatic pressure vessel. 4,351,363, Cl. 138-30.000.

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Toukan, Sameeh S.; and Hauptschein, Murray, 4,351,946, Cl. 548-142.000.

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Hayano, Fusakazu: *See—*
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Hayberg, Robert S.; and Foltuz, Eugene L., to Global Precision Inc. Pivoting hinge exercising mechanism. 4,351,630, Cl. 425-517.000.

Heeman, Volker: *See—*
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Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
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Heim, Ulrich: *See*—
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Heinz, Edward J.; and Collins, H. Thomas, to Raymond International Builders, Inc. Underwater storage of oil. 4,351,623, Cl. 405-210.000.
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Helgeson Nuclear Services, Inc.: *See*—
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Helms, Charles R., to Container Corporation of America. Composite carded display package. 4,351,436, Cl. 206-477.000.
Henery, Vern A., to PPG Industries Inc. Deposition of coatings from vaporized reactants. 4,351,861, Cl. 427-255.100.
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Starnes, Roger L.; Henson, Ernest D.; Wilkes, Thomas J.; and Sharp, James M., 4,351,221, Cl. 84-1.280.
Hentschel, Klaus: *See*—
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Herledan, Jean-Rene: *See*—
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Herman Miller, Inc.: *See*—
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Hermanutz, Peter; and Roessler, Franz, to International Standard Electric Corporation. Rack structure for electrical communications equipment. 4,352,146, Cl. 361-428.000.
Herrmann, Manfred: *See*—
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Herrmannsfeldt, William B.: *See*—
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Hertzler, Merle E., to RCA Corporation. System for applying a liquid to the studs of a color kinescope faceplate panel. 4,351,265, Cl. 118-211.000.
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., to Pfizer Inc. Chloro- and alkoxy-substituted-2-chloro-4-aminodquinazolines. 4,351,940, Cl. 544-293.000.
Hess, Viktor, to Alpine Aktiengesellschaft. Feed bars for shredding mills. 4,351,488, Cl. 241-224.000.
Hesselbart, Glenn A.; and Wobrak, Robert E., to Westinghouse Electric Corp. Interphase barrier for switchgear. 4,351,990, Cl. 200-50.0AA.
Hevenor, Charles M., Jr., to Gerber Scientific Instrument Company, The. Apparatus for storing and retrieving data. 4,352,165, Cl. 364-900.000.
Hewitt, John T. Diesel vehicle speed control system. 4,351,293, Cl. 123-198.0DB.
Heymer, Gero: *See*—
Elsner, Georg; Vollmer, Hartfrid; and Heymer, Gero, 4,351,960, Cl. 568-8.000.
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Hieber, Konrad; and Mayer, Norbert, to Siemens Aktiengesellschaft. Method of producing low-resistant, monocrystalline metallic layers by implanting ions into a polycrystalline metal layer and heating to produce a monocrystalline layer. 4,351,695, Cl. 156-603.000.
Higashino, Thikashi: *See*—
Kanemaru, Muneaki; Yoshida, Kenji; Higashino, Thikashi; and Kozima, Tadashi, 4,351,971, Cl. 568-898.000.
Hill, Brondus E., Jr., to Du Pont de Nemours, E. I., and Company. Yarn package support tube. 4,351,491, Cl. 242-18.0PW.
Hilterhaus, Karl-Heinz; and Moser, Reinhard, to Chemie-Anlagenbau Bischofsheim GmbH. Supply control apparatus for a mixing chamber. 4,351,354, Cl. 137-240.000.
Hinderliter Energy Equipment Corp.: *See*—
Clements, Gary B.; and Ramsey, Robert E., 4,351,090, Cl. 24-263.00D.
Hines, David A.: *See*—
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Hiraki, Shunichi: *See*—
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Hirano, Reiji; and Nakata, Shinichi, to Canon Kabushiki Kaisha. Electronic calculator capable of dealing with variables. 4,352,161, Cl. 364-706.000.
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, to Canon Kabushiki Kaisha. Motion picture camera with automatic focusing device. 4,351,590, Cl. 352-140.000.
Hirt, Theodore A.; and Dillon, Robert H., to Thomas Steel Strip Corp. Electro-co-deposition of corrosion resistant nickel/zinc alloys onto steel substrates. 4,351,713, Cl. 204-207.000.
Hitachi Chemical Company, Ltd.: *See*—
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Matsuda, Shinpei; Kato, Akira; Uno, Shigeo; Sakuta, Youichi; and Nakajima, Fumito, 4,351,811, Cl. 423-239.000.
Matsui, Makoto; Shiraki, Yasuhiro; Katayama, Yoshifumi; Tsukada, Toshihisa; and Maruyama, Eiichi, 4,351,856, Cl. 427-38.000.
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.
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Street, Sidney W.; and Beckley, Don A., 4,351,932, Cl. 526-262.000.
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George, Mark S., 4,351,690, Cl. 156-384.000.
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Hochstrasser, Ulrich; and Kertscher, Eberhard, to Maillefer S.A. Manufacture of insulated electric conductors. 4,351,790, Cl. 264-174.000.
Hoechst Aktiengesellschaft: *See*—
Billenstein, Siegfried; May, Adolf; and Bucking, Hans-Walter, 4,351,737, Cl. 252-8.800.
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Kammerer, Friedrich-Johannes; and Schleyerbach, Rudolf, 4,351,841, Cl. 424-272.000.
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von der Eltz, Hans-Ulrich; and Reuther, Albert, 4,351,076, Cl. 8-149.100.
Hoeschele, Guenther K., to Du Pont de Nemours, E. I., and Company. Molding material of polyethylene terephthalate and alkai metal salt of C_{30}–C_{54} substantially aliphatic carboxylic acid. 4,351,757, Cl. 524-169.000.
Hofer, Edwin; and Ohnmacht, Helmut, to Fritz Eichenauer, Firma. Electric heating device for heating the interior of a switch cabinet. 4,352,008, Cl. 219-540.000.
Hofmann, Helmut J. Cleaning apparatus for submerged surfaces. 4,351,077, Cl. 15-1.700.
Hohne, Gerd: *See*—
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Hohnerlein, Otto G., Jr.; Smith, Willie E., Jr.; and Rimedio, Nicholas T., Sr., to Savannah Foods & Industries, Inc. Removal of objectionable flavor and odor characteristics in finished sugar products produced from molasses. 4,351,672, Cl. 127-46.300.
Holbrook, Mark D.; and Knapp, William K., to RCA Corporation. Precharge circuit. 4,352,031, Cl. 307-444.000.
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Holland, Eddie L.; Stallings, Charles K.; and Parker, Jack, to U.S. Industries, Inc. Movable chick guard. 4,351,273, Cl. 119-51.00R.
Holland, Gerald F., to Pfizer Inc. Antidiabetic pyrrolecarboxylic acids. 4,351,843, Cl. 424-274.000.
Holmes, Horace D. Self-locking threaded fastener. 4,351,626, Cl. 411-311.000.
Holt, L. Earl: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Mueller, Dale A.; and Sperry, Timothy P., 4,352,079, Cl. 336-65.000.
Young, Miriam F., 4,351,101, Cl. 29-577.00C.
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Hope, Henry F.; and Hope, Stephen F., 4,351,613, Cl. 366-337.000.
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Hosiden Electronics Co., Ltd.: *See—*
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Howie, Robert K., Jr., to Grigoleit Company, The. Method of forming a laminated structural member and member formed thereby. 4,351,886, Cl. 428-591.000.
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Hudson, James W. Environmental control room dividers. 4,351,475, Cl. 237-46.000.
Huey-Miin, Perng. Automatic glass tube cutter. 4,351,459, Cl. 225-96.500.
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Humber, Leslie G.: *See—*
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Hunold, Klaus; Reinmuth, Klaus; Lipp, Alfred; Napholcz, Johannes; and Arnold, Peter, to Elektroschmelzwerk kempten GmbH. Process for the manufacture of substantially pore-free shaped polycrystalline articles by isostatic hot-pressing. 4,351,858, Cl. 427-193.000.
Hunziker, Walter, to Siemens Aktiengesellschaft. Method and a circuit arrangement for modifying control information in a traffic signal system, particularly a street traffic signal system. 4,352,086, Cl. 340-35.000.
Huperz, Adalbert: *See—*
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Hurwitz, Arthur; Michelucci, John; and Krupey, John, to American Home Products Corporation. Method of producing multicomponent lyophilized product. 4,351,158, Cl. 62-60.000.
Hutchins, Ferris L., Jr., to Mead Corporation, The. Temporary display stand for merchandizing. 4,351,246, Cl. 108-156.000.
Hybricon Inc.: *See—*
Fields, Gerald M.; and Metzner, Robert G., 4,351,405, Cl. 180-65.00A.
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Ichikawa, Shigeo; Ito, Motonobu; and Aiba, Makoto, to Taiho Kogyo Kabushiki Kaisha. Method of manufacturing an arc-like formed product and equipment for carrying out the method. 4,351,175, Cl. 72-203.000.
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IHC Holland N.V.: *See—*
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Imayasu, Tomoyoshi; and Isono, Katsuo, to Sony Corporation. Side pincushion correcting circuit for color television receivers. 4,352,047, Cl. 315-370.000.
Immer, Hans U.: *See—*
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Industrie Pirelli S.p.A.: *See—*
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Ballocci, Giovanni; and Brollo, Aurelio, 4,351,432, Cl. 198-847.000.
Ingersoll, Brian E.; Nicholson, Ross C.; and Dennisson, James W., to General Electric Company. Packaging container for mining and construction tools. 4,351,448, Cl. 220-318.000.
Inglefield, Joseph T., Jr. Safety device for securing thumb or finger to a syringe. 4,351,334, Cl. 128-218.0PA.
Initiators, The: *See—*
Kordes, Arthur W.; Andrade, Robert M.; and Peterson, Roger W., 4,351,579, Cl. 339-14.00R.
Inoue, Akihiko; and Ito, Takeo, to Alps Electric Company, Ltd. Vibration-preventing mechanism for use in a push button switch. 4,351,995, Cl. 200-159.00A.
Inoue, Kenzo. Speaker device. 4,351,411, Cl. 181-168.000.
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, to Canon Kabushiki Kaisha. Photographing apparatus. 4,351,609, Cl. 355-50.000.
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Inovius, Allan. Reactor. 4,351,249, Cl. 110-210.000.
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International Harvester Company: *See—*
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Ionics, Incorporated: *See—*
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Iowa State University Research Foundation, Inc.: *See*—
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Irwin, Howard D., to Du Pont de Nemours, E. I., and Company. Railway car truck side frame. 4,351,242, Cl. 105-206.00A.

Isaka, Tsutomu: *See*—
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, 4,351,876, Cl. 428-349.000.

Ishibashi, Kazuhisa; Matsui, Sadaki; Yasumuro, Hisakazu; Imatani, Tsuneo; Ueno, Hiroshi; and Kobayashi, Seishichi, to Toyo Seikan Kaisha Limited. Method and apparatus for producing welded metallic can body. 4,352,001, Cl. 219-64.000.

Ishibe, Nobuyuki; and Richey, Warren F., to Dow Chemical Company, The. Stabilized methylchloroform. 4,351,973, Cl. 570-104.000.

Ishida, Tokuji; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Electronic exposure and flash control systems for slit-shutter type cameras. 4,351,594, Cl. 354-139.000.

Ishii, Katsumi: *See*—
Tuchiya, Yoshimasa; Ishii, Katsumi; Iidaka, Toshiharu; and Fujita, Masao, 4,351,561, Cl. 296-216.000.

Ishii, Takahiro: *See*—
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.

Ishimatsu, Kenji: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.

Isley, Ralph E.: *See*—
Prem, Dorothy C.; Duke, June T.; and Isley, Ralph E., 4,351,756, Cl. 524-314.000.

Isogai, Kiyoshi; and Sugaya, Kazuyoshi, to Nippondenso Co., Ltd. Fuel injection apparatus for an internal combustion engine. 4,351,305, Cl. 123-590.000.

Isono, Katsuo: *See*—
Imayasu, Tomoyoshi; and Isono, Katsuo, 4,352,047, Cl. 315-370.000.

Isover Saint-Gobain: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Battigelli, Jean A.; and Plantard, Dominique, 4,351,661, Cl. 65-5.000.
Meunier, Georges, 4,351,119, Cl. 34-28.000.
Plantard, Dominique; Langlais, Gerard; and Fournier, Rene, 4,351,660, Cl. 65-5.000.

Itek Corporation: *See*—
Ouellette, Alfred R., 4,351,460, Cl. 226-25.000.

Ito, Masao: *See*—
Nagamoto, Shunichi; Ito, Masao; Saka, Tatsuo; and Kobayashi, Tetsu, 4,351,999, Cl. 219-10.55B.

Ito, Motonobu: *See*—
Ichikawa, Shigeo; Ito, Motonobu; and Aiba, Makoto, 4,351,175, Cl. 72-203.000.

Ito, Takeo: *See*—
Inoue, Akihiko; and Ito, Takeo, 4,351,995, Cl. 200-159.00A.

Ito, Teruyoshi: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; and Yamada, Takashi, 4,351,282, Cl. 123-425.000.

Ito, Tsunetoshi: *See*—
Takahashi, Ken; and Ito, Tsunetoshi, 4,351,565, Cl. 299-1.000.

Itoh, Masashi, to Matsushita Electric Industrial Co., Ltd. Electromagnetic pickup cartridge. 4,352,176, Cl. 369-170.000.

ITT Industries, Inc.: *See*—
Burgdorf, Jochen, 4,351,420, Cl. 188-73.450.
Flamm, Peter M., 4,352,123, Cl. 358-23.000.
Schopper, Bernd, 4,351,571, Cl. 303-40.000.

Ivy, James R. Portable campfire grill assembly. 4,351,312, Cl. 126-30.000.

Iwagami, Seigo: *See*—
Yoshida, Tooru; Iwagami, Seigo; Ueshima, Takashi; and Hosoda, Yoshikazu, 4,351,922, Cl. 525-116.000.

Iwama, Hideto: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, 4,351,590, Cl. 352-140.000.

Iwane, Yoshitaka: *See*—
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,351,834, Cl. 424-249.000.

Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Pressure sensor. 4,351,191, Cl. 73-728.000.

Iwata, Mitsuo; Masuda, Naomasa; Uraki, Hideki; and Tsuchino, Kunio, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Cassette tape device. 4,351,498, Cl. 242-204.000.

Iwata, Toshiharu: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; and Yamada, Takashi, 4,351,282, Cl. 123-425.000.

Iwaya, Toshio: *See*—
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,351,609, Cl. 355-50.000.

Izumi, Kenkichi: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.

Izumi, Shigeru: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

J.C. Penney Company, Inc.: *See*—
Woodring, Cooper C.; and Torbet, Philip A., 4,351,418, Cl. 188-24.220.

J. I. Case Company: *See*—
Mozingo, Robert E., 4,351,199, Cl. 74-566.000.

J. M. Voith GmbH: *See*—
Egelhof, Dieter; and Schmid, Hans R., 4,351,728, Cl. 210-415.000.
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

J. R. Simplot Company: *See*—
Glorfield, Paul H.; Bryant, Spencer L.; and Kirklin, Vance L., 4,351,141, Cl. 53-473.000.

Jaffe, Stephen B., to Mobil Oil Corporation. Catalyst for hydrotreating residual petroleum oil. 4,351,717, Cl. 208-216.0PP.

Jahnke, Joachim; Lehming, Gunther; Kunig, Helmut; and Nagel, Jens, to Nordischer Maschinenbau Rud. Baader. Needle bar draw frame. 4,351,089, Cl. 19-129.00R.

Jain, Surendar M., to Ionics, Incorporated. Fractionation of protein mixtures. 4,351,710, Cl. 204-180.00P.

Jasperson, F. Bon, to Northwood Mills Ltd. Stucco composition. 4,351,912, Cl. 523-218.000.

Jendrick, Rodney J., to Xerox Corporation. Sheet feeding apparatus. 4,351,519, Cl. 271-117.000.

Jenkins, Arthur P.: *See*—
Coote, Jack H.; and Jenkins, Arthur P., 4,351,608, Cl. 355-35.000.

Jensen, Thomas H., to PPG Industries, Inc. High pressure forming bushing. 4,351,656, Cl. 65-1.000.

Jetter, Milton W. Alarm deactivation system employing timed manual switch operation. 4,352,170, Cl. 368-73.000.

Jetter, Milton W. Clock alarm-deactivating system. 4,352,171, Cl. 368-73.000.

Jirkovsky, Ivo L.: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,351,942, Cl. 546-269.000.

Jochum, Peter; and Gasser, Oswald, to Espe Fabrik Parmazeutischer Praparate G.m.b.H. Method for producing prosthetic dental appliances by photopolymerizing a shapeable mass. 4,351,853, Cl. 427-2.000.

Joh.Friedrich Behrens AG: *See*—
Fehrs, Hellmuth; and Elliesen, Wolfgang, 4,351,464, Cl. 227-7.000.

Johannsen, Donald L. Air conducting mechanism. 4,351,163, Cl. 62-305.000.

Johansson, Bengt; Keinonen, Arno; and Makinen, Eero, to Oy Wartsila AB. Ice-breaking ship. 4,351,255, Cl. 114-41.000.

John Manufacturing Limited: *See*—
Yuen, Se-kit, 4,351,125, Cl. 40-381.000.

Johne, Albrecht: *See*—
Tappert, Hans-Jurgen; Schulz, Horst; Johne, Hans; and Johne, Albrecht, 4,351,237, Cl. 101-216.000.

Johne, Hans: *See*—
Tappert, Hans-Jurgen; Schulz, Horst; Johne, Hans; and Johne, Albrecht, 4,351,237, Cl. 101-216.000.

Johns, Allan T., to General Electric Company Limited, The. Methods and apparatus for fault detection. 4,352,137, Cl. 361-82.000.

Johnsen, Ulf: *See*—
Axelsson, Bror; Johnsen, Ulf; Stenstrom, Lennart; and Thors, Bengt, 4,352,140, Cl. 361-127.000.

Johnson, Ben E. Solar collector panel. 4,351,321, Cl. 126-446.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Method and apparatus for selective positioning of spectral filter during exposure control. 4,351,593, Cl. 354-27.000.

Johnson, Clifford T.: *See*—
McCubbin, Melvin J.; and Johnson, Clifford T., 4,351,239, Cl. 102-364.000.
McCubbin, Melvin J.; Johnson, Clifford T.; and Cordle, Paul E., 4,351,240, Cl. 102-364.000.

Johnson, David A.: *See*—
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,351,766, Cl. 260-239.100.

Johnson, James E., to Reliability, Inc. Packaging system for semiconductor burn-in. 4,351,108, Cl. 29-741.000.

Johnson, John H., to General Electric Company. Single phase motor with reversible auxiliary windings. 4,352,051, Cl. 318-790.000.

Johnson, Louis W. Power drive structure for rotating threadedly supported rock crusher bowls. 4,351,490, Cl. 241-286.000.

Johnson, Matthey & Co., Limited: *See*—
Bishop, David C.; and Heywood, Alan E., 4,351,887, Cl. 428-594.000.

Johnson, Michael R., to Pfizer Inc. 9-Amino-1-hydroxyoctahydrobenzo[c]quinolines and derivatives thereof as analgesics and anti-emetics. 4,351,833, Cl. 424-248.500.

Johnson-Progress, Limited: *See*—
Jones, Paul F., 4,351,724, Cl. 210-230.000.

Johnston, Leslie H.: *See*—
Burns, Terry A.; and Johnston, Leslie H., 4,352,134, Cl. 360-123.000.

Jokh, Thomas: *See*—
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.

Jones, Brenton E.: *See*—
Reusser, Robert E.; Claytor, Elizabeth A.; and Jones, Brenton E., 4,351,980, Cl. 585-820.000.

Jones, John H.: *See*—
Kaelblein, Robert; and Jones, John H., 4,351,474, Cl. 229-68.00R.

Jones, Paul F., to Johnson-Progress, Limited. Filter assembly having side-supported slidable king and queen ends. 4,351,724, Cl. 210-230.000.

Jones, Peter W. J.; and Purcell, Dennis W. Self-calibrating speedometer/odometer. 4,352,063, Cl. 324-171.000.

Jones, Richard D., to Solar Energy of Colorado, Inc. Method and apparatus for using solar energy to augment a refrigerant heating and cooling system. 4,351,161, Cl. 62-235.100.

Jonsson, Sven A. Method for manufacture of a boat deck having a surface of adjacent strips, and a deck manufactured according to the method. 4,351,256, Cl. 114-85.000.

Jore, Alfred; Van Gorkom, Gerardus G. P.; and Dekkers, Nicolaas H., to U.S. Philips Corporation. Anti-contamination diaphragm for an electron beam apparatus. 4,352,015, Cl. 250-311.000.

Joseph, A. David: *See—*
Anderson, David L.; and Joseph, A. David, 4,351,550, Cl. 285-158.000.

Joshi, David; and Klingaman, Richard, to Colgate Palmolive Company. Bottled particulate detergent. 4,351,740, Cl. 252-90.000.

Joy Manufacturing Company: *See—*
Lapointe, Roland R., 4,351,399, Cl. 173-148.000.

Julius Blum Gesellschaft m. b. H.: *See—*
Rock, Erich; and Mages, Bernhard, 4,351,575, Cl. 308-3.800.

JWI, Ltd.: *See—*
Kirby, Garry E., 4,351,874, Cl. 428-229.000.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Bauermeister, Klaus; Ziemek, Gerhard; and Eilhardt, Bernd, 4,351,365, Cl. 138-149.000.
Leykamm, Herbert; and Knabel, Siegfried, 4,351,177, Cl. 72-354.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Asano, Kazuhiro, 4,352,169, Cl. 368-73.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,352,172, Cl. 368-76.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Fujiwara, Yasuo; Maeo, Hidemi; and Muramoto, Eiichi, 4,351,572, Cl. 305-27.000.

Kabushiki Kaisha Medos Kenkyusho: *See—*
Ouchi, Teruo; and Ueda, Hirohisa, 4,351,323, Cl. 128-4.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Kuwako, Tomohisa, 4,352,036, Cl. 310-83.000.
Morita, Masayuki; and Nakano, Tasuku, 4,351,991, Cl. 200-61.270.

Kabushiki Kaisha Tokuda Seisakusho: *See—*
Kuriyama, Noboru, 4,351,714, Cl. 204-298.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Arakawa, Hiroshi, 4,351,369, Cl. 139-435.000.

Kaelblein, Robert; and Jones, John H., to Beatrice Foods Co. Mailer with sticker-type sign. 4,351,474, Cl. 229-68.00R.

Kahut, Marvin L.: *See—*
Keehner, James E.; Linn, Samuel A.; Kahut, Marvin L.; Forrester, Bobby G.; and Bohanan, Roy E., 4,351,234, Cl. 101-10.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Goodrich, David G., 4,351,384, Cl. 164-468.000.

Kaiser, Emil T. Synthesis of 24,25-dihydroxycholesterol. 4,351,767, Cl. 260-239.55R.

Kajiyama, Ryuichi: *See—*
Terazono, Narihiro; and Kajiyama, Ryuichi, 4,351,416, Cl. 187-29.00R.

Kakizaki, Masao: *See—*
Klagane, Kiyoshi; and Kakizaki, Masao, 4,351,104, Cl. 29-603.000.

Kalbskopf, Reinhard; and Baumberger, Otto, to Societe Italiana Vetro-Siv-S.p.A. Apparatus for continuously depositing a layer of a solid material on the surface of a substrate heated to a high temperature. 4,351,267, Cl. 118-718.000.

Kalivas, Risty T.: *See—*
Dampier, Frederick W.; and Kalivas, Risty T., 4,351,888, Cl. 429-62.000.

Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, to Mitsubishi Rayon Co., Ltd. Radiation cured acrylate coating method and coated product. 4,351,881, Cl. 428-412.000.

Kamerling, Marc A., to Optical Coating Laboratory, Inc. Contrast enhancement filter and method. 4,351,681, Cl. 156-99.000.

Kammerer, Friedrich-Johannes; and Schleyerbach, Rudolf, to Hoechst Aktiengesellschaft. Pharmaceutical preparation and method of treatment. 4,351,841, Cl. 424-272.000.

Kanazawa, Akio: *See—*
Nishimura, Tadahiko; Yamamoto, Hiroshi; Osuo, Masatoshi; and Kanazawa, Akio, 4,351,967, Cl. 568-754.000.

Kanebo, Ltd.: *See—*
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,351,879, Cl. 428-374.000.

Kanebo Synthetic Fibers Ltd.: *See—*
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,351,879, Cl. 428-374.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, 4,351,976, Cl. 570-262.000.

Kaneko, Makoto: *See—*
Suzuki, Hideo; and Kaneko, Makoto, 4,351,214, Cl. 84-1.030.

Kaneko, Thomas M., to BASF Wyandotte Corporation. Liquified normally solid polyoxyalkylene block copolymers. 4,351,753, Cl. 252-357.000.

Kanemaru, Muneaki; Yoshida, Kenji; Higashino, Thikashi; and Kozima, Tadashi, to Mitsui Toatsu Chemicals, Inc. Process for preparing lower alcohols. 4,351,971, Cl. 568-898.000.

Kano, Gota: *See—*
Takagi, Hiromitsu; Umebachi, Shotaro; Kano, Gota; and Teramoto, Iwao, 4,351,099, Cl. 29-571.000.

Kanou, Noboru; and Mori, Keiji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Removable roof of a motor vehicle. 4,351,560, Cl. 296-216.000.

Karasawa, Shuichi; Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, to Ricoh Company, Ltd. Multi-color electrostatic copying apparatus. 4,351,604, Cl. 355-4.000.

Karhan, Barry L.; and Archibald, James B., to General Electric Company. Stator core with axial and radial cooling for dynamoelectric machines wth air-gap stator windings. 4,352,034, Cl. 310-59.000.

Karlen, Urs: *See—*
Baumgartner, Peter; Karlen, Urs; and Keller, Urs, 4,351,774, Cl. 260-383.000.

Kart, Warren E.: *See—*
Toffolon, Roger L.; and Kart, Warren E., 4,351,507, Cl. 249-63.000.

Kastura, John L.: *See—*
Luckman, James E.; Winstead, William P.; and Kastura, John L., 4,351,306, Cl. 123-609.000.

Kasugayama, Yukio: *See—*
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.

Kasuya, Michio: *See—*
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,351,609, Cl. 355-50.000.

Katayama, Yoshifumi: *See—*
Matsui, Makoto; Shiraki, Yasuhiro; Katayama, Yoshifumi; Tsukada, Toshihisa; and Maruyama, Eiichi, 4,351,856, Cl. 427-38.000.

Kato, Akira: *See—*
Matsuda, Shinpei; Kato, Akira; Uno, Shigeo; Sakuta, Youichi; and Nakajima, Fumito, 4,351,811, Cl. 423-239.000.

Kato, Masaki; and Tobita, Katsumi, to Alps Electric Company, Ltd. Tuning system. 4,352,205, Cl. 455-183.000.

Kauffman, Gilbert, to Ametek, Inc. Spark cell ozone generator. 4,351,734, Cl. 210-748.000.

Kaufmann, Reinhold: *See—*
Schleupen, Richard; Kaufmann, Reinhold; and Raff, Dieter, 4,351,309, Cl. 123-630.000.

Kautz, Wilbert G.: *See—*
Brandenberg, Karl A.; and Kautz, Wilbert G., 4,351,225, Cl. 91-50.000.

Kawachi, Yasunori: *See—*
Kishida, Kazuo; Hasegawa, Akira; and Kawachi, Yasunori, 4,351,921, Cl. 525-80.000.

Kawai, Hiromasa: *See—*
Sugitani, Hatuo; Kudo, Takeo; Mukoyama, Yoshiyuki; and Kawai, Hiromasa, 4,351,910, Cl. 521-56.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See—*
Deutsch, Ralph, 4,351,218, Cl. 84-1.190.

Kawasaki, Haruhiko: *See—*
Koiwai, Hideshi; Matsumura, Shizuo; and Kawasaki, Haruhiko, 4,351,356, Cl. 137-491.000.

Kawasaki, Hiroshi: *See—*
Masuda, Eiji; and Kawasaki, Hiroshi, 4,352,092, Cl. 340-347.0DA.

Kawasaki, Itaru: *See—*
Nyuji, Tomoaki; Kawasaki, Itaru; Noguchi, Masahiro; and Tsukamoto, Masahide, 4,352,162, Cl. 364-724.000.

Kawasaki Steel Corporation: *See—*
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, 4,351,576, Cl. 308-37.000.

Kawasaki, Teruo: *See—*
Nomura, Hiroyuki; Kawasaki, Teruo; and Takeuchi, Mikio, 4,352,062, Cl. 324-169.000.

Kayaba Kogyo Kabushiki Kaisha: *See—*
Koiwai, Hideshi; Matsumura, Shizuo; and Kawasaki, Haruhiko, 4,351,356, Cl. 137-491.000.

Kayanuma, Nobuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for controlling deceleration of an internal combustion engine. 4,351,296, Cl. 123-328.000.

Kazuno, Yuzo: *See—*
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.

Keehner, James E.; Linn, Samuel A.; Kahut, Marvin L.; Forrester, Bobby G.; and Bohanan, Roy E., to General Foods Corporation. Marking apparatus with orbiting marking head. 4,351,234, Cl. 101-10.000.

Keinonen, Arno: *See—*
Johansson, Bengt; Keinonen, Arno; and Makinen, Eero, 4,351,255, Cl. 114-41.000.

Keller, Teddy M.; and Griffith, James R., to United States of America, Navy. Preparation of iodophthalonitrile. 4,351,776, Cl. 260-465.00G.

Keller, Urs: *See—*
Baumgartner, Peter; Karlen, Urs; and Keller, Urs, 4,351,774, Cl. 260-383.000.

Kelly, Darrell A.: *See—*
Blackmon, Lawrence E.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,351,147, Cl. 57-208.000.

Kelly, William D.; and Vella, Gregory J., to Balmar Crimp Tool Corp. Contact insertion/removal tool. 4,351,109, Cl. 29-747.000.

Kemp, Ian: *See—*
Corner, Michael R.; Kemp, Ian; and French, Tom, 4,351,382, Cl. 152-330.0RF.

Kendrick, Raymond D.; Wind, Robert A.; and Yannoni, Costantino S., to International Business Machines Corporation. Method for adjusting the magic angle in NMR experiments. 4,352,066, Cl. 324-321.000.

Kent, Brian, to Starcote Limited. Touch switch device. 4,352,141, Cl. 361-181.000.

Keogh, Michael J., to Union Carbide Corporation. Heat curable polymer. 4,351,926, Cl. 525-370.000.

Keppel, Heinrich; Klapper, Peter; and Fleischmann, Herbert, to Licentia Patent-Verwaltungs-GmbH. Microwave oven with resistance heating unit. 4,351,998, Cl. 219-10.55R.

Kercheval, Marie C.: *See*—
Wittmaier, Edward A., 4,352,087, Cl. 340-632.000.

Kerkenbush, Darle L.; Whittington, Jimmie L.; and Sanchez, Terry J., to Wham-O Mfg. Company. Flying disc with central insert. 4,351,129, Cl. 46-74.00D.

Kern, Eugene F. Barbecue grill slab with mold as shipping container. 4,351,313, Cl. 126-39.00J.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Becker, Erwin W.; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,351,653, Cl. 55-394.000.

Kerr Glass Manufacturing Corp.: *See*—
Fuller, Stuart C., 4,351,693, Cl. 156-556.000.

Kerschner, James J., to Acme Highway Products Corporation. Expansion seal. 4,351,622, Cl. 404-64.000.

Kertscher, Eberhard: *See*—
Hochstrasser, Ulrich; and Kertscher, Eberhard, 4,351,790, Cl. 264-174.000.

Khanna, Pyare; and Ullman, Edwin F., to Syva Company. Novel alkyl substituted fluorescent compounds and polyamino acid conjugates. 4,351,760, Cl. 260-112.00R.

Khanna, Ram-Tirth, to Du Pont de Nemours, E. I., and Company. Corrosion-resistant, improved powder primer surfacer. 4,351,914, Cl. 523-448.000.

Khoury, Nick S.: *See*—
Giggard, Earl D.; Khoury, Nick S.; Kowalik, John J.; and Terrien, Donald R., 4,351,445, Cl. 220-91.000.

Khudyakov, Georgy N.: *See*—
Zhukov, Mikhail F.; Lytkin, Albert Y.; Khudyakov, Georgy N.; and Anshakov, Anatoly S., 4,352,044, Cl. 315-111.210.

Kiessling, Werner; Wiedemann, Otto; Lau, Peter; and Vondrovsky, Gabriel, to Agfa-Gevaert Aktiengesellschaft. Cassette for band material. 4,351,497, Cl. 242-194.000.

Kijima Musen Kabushiki Kaisha: *See*—
Kijima, Seiichi, 4,352,081, Cl. 336-198.000.

Kijima, Seiichi, to Kijima Musen Kabushiki Kaisha. Compact trans core. 4,352,081, Cl. 336-198.000.

Kim, Byung H.: *See*—
Suh, Nam P.; Senturia, Stephen D.; and Kim, Byung H., 4,352,059, Cl. 324-61.00R.

Kimball International, Inc.: *See*—
Bass, Steven C., 4,351,219, Cl. 84-1.210.

Kimberly-Clark Corporation: *See*—
Day, Winterton U., 4,351,793, Cl. 264-518.000.

Kimura, Takao; Sakaguchi, Shigeki; and Takata, Hisao, to Nippon Telegraph & Telephone Public Corporation. Method for coating optical fibers with thermoplastic resin. 4,351,657, Cl. 65-3.110.

Kindt, Lawrence J.: *See*—
Rosenberg, Arnold M.; Gaidis, James M.; and Kindt, Lawrence J., 4,351,671, Cl. 106-90.000.

Kinsolving, Clyde R.: *See*—
Griffith, Ronald C.; and Kinsolving, Clyde R., 4,351,847, Cl. 424-325.000.

Kirby, Garry E., to JWI, Ltd. Low permeability dryer fabric. 4,351,874, Cl. 428-229.000.

Kirchmayr, Rudolf: *See*—
Berner, Godwin; and Kirchmayr, Rudolf, 4,351,708, Cl. 204-159.230.

Kirklin, Vance L.: *See*—
Glorfield, Paul H.; Bryant, Spencer L.; and Kirklin, Vance L., 4,351,141, Cl. 53-473.000.

Kirkman, Michael; Rydwansky, Frank C., Jr.; Hanlon, Richard J.; and Petersen, Richard W., to Augat Inc. Carrier socket for leadless integrated circuit devices. 4,351,580, Cl. 339-17.0CF.

Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, to Mitsubishi Rayon Co., Ltd. Glass fiber reinforced polyethylene terephthalate resin composition. 4,351,751, Cl. 524-375.000.

Kishida, Kazuo; Hasegawa, Akira; and Kawachi, Yasunori, to Mitsubishi Rayon Co., Ltd. Resin composition for use in uncoated exterior material. 4,351,921, Cl. 525-80.000.

Kishida, Takashi: *See*—
Aoyama, Hideki; and Kishida, Takashi, 4,351,492, Cl. 242-18.00R.

Kita, Yasuo, to Shimadzu Corporation. Hydraulic elevator installation. 4,351,415, Cl. 187-29.00B.

Kitamura, Kazuaki: *See*—
Fukushima, Osamu; Akisada, Masahide; Monma, Yoshiyuki; and Kitamura, Kazuaki, 4,352,198, Cl. 378-185.000.

Kitamura, Masaki; Saisu, Naoki; and Koide, Shigeo, to Kitamura, Masaki. Cartridge equalizer. 4,352,178, Cl. 369-252.000.

Kivits, Hendrikus P. M.: *See*—
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,351,807, Cl. 423-24.000.

Kiyooka, Hisamaro, to Harada Industry Co., Ltd. Matching cable for automobile antennas for receiving FM broadcasts. 4,352,107, Cl. 343-715.000.

Klagane, Kiyoshi; and Kakizaki, Masao, to TDK Electronics Co., Ltd. Method for manufacturing magnetic heads. 4,351,104, Cl. 29-603.000.

Klapper, Peter: *See*—
Keppel, Heinrich; Klapper, Peter; and Fleischmann, Herbert, 4,351,998, Cl. 219-10.55R.

Klauke, Erich: *See*—
Baasner, Bernd; Klauke, Erich; and Kysela, Ernst, 4,351,974, Cl. 570-174.000.

Klauschenz & Perrot KG: *See*—
Perrot, Erwin, 4,351,731, Cl. 210-647.000.

Kleemann, Axel; and Schalke, Peter M., to Degussa AG. Process for the recovery of malonodinitrile. 4,351,778, Cl. 260-465.80R.

Kleinhappl, Erich: *See*—
Marsoner, Hermann; List, Helmut; and Kleinhappl, Erich, 4,351,798, Cl. 422-63.000.

Kletny, Mikhail M.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Klijnstra, Jan H.: *See*—
Van Herk, Alfred; Buis, Jacob A. M.; Klijnstra, Jan H.; and Van Staalduinen, Jan, 4,352,131, Cl. 360-78.000.

Kline, Donald D., to Bell & Howell Company. Aircraft passenger entertainment system. 4,352,124, Cl. 358-60.000.

Klingaman, Richard: *See*—
Joshi, David; and Klingaman, Richard, 4,351,740, Cl. 252-90.000.

Klinge, Gerd: *See*—
Upmeier, Hartmut; Klinge, Gerd; and Winkler, Gerhard, 4,351,785, Cl. 264-40.100.

Kluger, Edward W.; and Welch, Calvin D., to Milliken Research Corporation. Epoxy resin compositions. 4,351,934, Cl. 528-111.000.

Knabel, Siegfried: *See*—
Leykamm, Herbert; and Knabel, Siegfried, 4,351,177, Cl. 72-354.000.

Knapp, William K.: *See*—
Holbrook, Mark D.; and Knapp, William K., 4,352,031, Cl. 307-444.000.

Knecht, Siegfried H., to Maschinenfabrik Alfred Schmermund GmbH & Co. Device for feeding web-shaped packaging material. 4,351,463, Cl. 226-154.000.

Knifton, John F., to Texaco Inc. Preparation of ethylene glycol. 4,351,907, Cl. 518-700.000.

Knowles, Albert H.: *See*—
Rines, Robert H.; and Knowles, Albert H., 4,351,269, Cl. 119-3.000.

Knox, Charles R.: *See*—
Crouse, William G.; and Knox, Charles R., 4,351,983, Cl. 179-1.0SC.

Kobayashi, Isao: *See*—
Date, Tasuku; Nomura, Toshio; and Kobayashi, Isao, 4,352,158, Cl. 364-431.050.

Kobayashi, Izumi: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Kobayashi, Kimiyuki: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,351,765, Cl. 260-163.000.

Kobayashi, Masateru: *See*—
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,351,947, Cl. 548-251.000.

Kobayashi, Seishichi: *See*—
Ishibashi, Kazuhisa; Matsui, Sadaki; Yasumuro, Hisakazu; Imatani, Tsuneo; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,352,001, Cl. 219-64.000.

Kobayashi, Tetsu: *See*—
Nagamoto, Shunichi; Ito, Masao; Saka, Tatsuo; and Kobayashi, Tetsu, 4,351,999, Cl. 219-10.55B.

Kobler, Ingo, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Internally cooled roller body construction. 4,351,386, Cl. 165-89.000.

Koch, Fenton C. Apparatus for purifying molten metal. 4,351,514, Cl. 266-217.000.

Kochengin, Evgeny Y.: *See*—
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.

Koehler Manufacturing Company: *See*—
Sundberg, Erik G., 4,351,889, Cl. 429-141.000.

Koerwer, John F., to Union Carbide Corporation. Enol derivatives of 2-aryl-1,3-cyclohexanedione compound as sugar enhancer for plants. 4,351,666, Cl. 71-106.000.

Kohan, Melvin I., to Du Pont de Nemours, E. I., and Company. Polyoxymethylene molding blends. 4,351,916, Cl. 524-377.000.

Kohn, Jean, to Baltek Corporation. Technique for converting balsa logs into contourable panels. 4,351,680, Cl. 156-79.000.

Koide, Shigeo: *See*—
Kitamura, Masaki; Saisu, Naoki; and Koide, Shigeo, 4,352,178, Cl. 369-252.000.

Koike, Kouichi: *See*—
Horiba, Isao; Yanaka, Shigenobu; Kuwabara, Yasuo; and Koike, Kouichi, 4,352,020, Cl. 378-18.000.

Koiwai, Hideshi; Matsumura, Shizuo; and Kawasaki, Haruhiko, to Kayaba Kogyo Kabushiki Kaisha. Pressure control valve. 4,351,356, Cl. 137-491.000.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Tuchiya, Yoshimasa; Ishii, Katsumi; Iidaka, Toshiharu; and Fujita, Masao, 4,351,561, Cl. 296-216.000.

Koller, Floyd G.; and Drew, Ralph H., Jr., to Auto-Valve, Inc. Drain valve. 4,351,355, Cl. 137-329.060.

Kolomayets, George: *See*—
Dennis, James T.; and Kolomayets, George, 4,352,177, Cl. 369-246.000.

Kolowski, Michael A.: *See*—
Roberts, Charles W.; Lindner, Daniel J.; Kwee, Henry T.; Kolowski, Michael A.; and Fetty, Harold D., 4,351,381, Cl. 152-209.00R.

Komurasaki, Satoshi; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing controller for an internal combustion engine. 4,351,307, Cl. 123-618.000.

Kondo, Shigeki; Iketani, Tomofumi; Yamazaki, Yoshio; Doi, Keiichiro; and Tanaka, Seiji, to Riccar Co., Ltd.; and Sharp Kabushiki Kaisha. Induction heating apparatus with thermistor and magnetic sensor. 4,351,996, Cl. 219-10.49R.

Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, to Kanebo, Ltd.; and Kanebo Synthetic Fibers Ltd. Porous acrylic synthetic fibers comprising cellulose acetate in an acrylic matrix. 4,351,879, Cl. 428-374.000.

Kondrashov, Alexei I.: *See*—
Laptev, Lev N.; Legotsky, Sergei S.; Semenovsky, Viadimir A.; Sambursky, Sergei S.; Litvinov, Abram B.; and Kondrashov, Alexei I., 4,351,489, Cl. 241-261.300.

Koogler, Steven C., to R. L. Drake Company. Variable rate tuning for radio transmitters and receivers. 4,352,010, Cl. 235-92.0EV.

Kopp, Reiner H.; and Panetz, Allen I., to Biochemical Diagnostics, Inc. Thin layer plate chromatography apparatus. 4,351,800, Cl. 422-70.000.

Kordes, Arthur W.; Andrade, Robert M.; and Peterson, Roger W., to Initiators, The. Clamp for electrical cable and cable terminating system. 4,351,579, Cl. 339-14.00R.

Kortmann, Wilfried: *See*—
Steinberger, Helmut; Moretto, Hans-Heinrich; Kortmann, Wilfried; and Pfeiffer, Josef, 4,351,736, Cl. 252-8.600.

Koshino, Yutaka: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,351,894, Cl. 430-313.000.

Kosmala, Rupert M. Hydraulic control device. 4,351,153, Cl. 60-581.000.

Kosonen, Ahti A., to Outokumpu Oy. Copper wire for intrauterina contraceptive devices and a method for manufacturing the same. 4,351,326, Cl. 128-130.000.

Kountz, Kenneth J.; and Erth, Richard A., to Borg-Warner Corporation. Capacity control systems for screw compressor based water chillers. 4,351,160, Cl. 62-201.000.

Kowalik, John J.: *See*—
Giggard, Earl D.; Khoury, Nick S.; Kowalik, John J.; and Terrien, Donald R., 4,351,445, Cl. 220-91.000.

Kozhanov, Evgeny V.: *See*—
Gross, Valery N.; Kozhanov, Evgeny V.; Stupnik, Vyacheslav D.; and Valov, Vladimir V., 4,351,799, Cl. 422-63.000.

Kozima, Tadashi: *See*—
Kanemaru, Muneaki; Yoshida, Kenji; Higashino, Thikashi; and Kozima, Tadashi, 4,351,971, Cl. 568-898.000.

Kraft, Hermann: *See*—
Beisel, Hermann; and Kraft, Hermann, 4,351,236, Cl. 101-148.000.

Kramer, Gunter. Liquid crystal display of time dependent signals. 4,352,102, Cl. 340-784.000.

Kranz, Walter; and Tillmann, Heinz, to Messerschmitt-Bolkow-Blohm GmbH. Jet engine with a thrust vector control. 4,351,479, Cl. 239-265.230.

Krebs, Waldemar; and Bromme, Hermann, to Chemische Werke Huls Aktiengesellschaft. Process for the removal of precipitates in heat exchangers of low temperature installations. 4,351,654, Cl. 62-13.000.

Kremer, Robert. Heat recovery device for boilers. 4,351,276, Cl. 122-20.00B.

Kress, Paul J.: *See*—
Marcantonio, Arnold F.; Kress, Paul J.; and Powers, John W., 4,351,883, Cl. 428-450.000.

Kreuzer, Helmut: *See*—
Grozinger, Alfred; Frister, Manfred; and Kreuzer, Helmut, 4,351,102, Cl. 29-596.000.

Kriebitzsch, Norbert; Puschner, Kurt; and Hentschel, Klaus, to Degussa Aktiengesellschaft. Process for handling liquid cyanuric chloride. 4,351,644, Cl. 23-293.00R.

Krieg, Gunther: *See*—
Becker, Erwin W.; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,351,653, Cl. 55-394.000.

Krjuk, Timur P.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Kroenig, Hans E. K. System for processing potatoes. 4,351,232, Cl. 99-540.000.

Kroll, Walter. Combustion apparatus for burning waste oils. 4,351,316, Cl. 126-93.000.

Krupey, John: *See*—
Hurwitz, Arthur; Michelucci, John; and Krupey, John, 4,351,158, Cl. 62-60.000.

Krupp-Koppers GmbH: *See*—
Deuser, Norbert; and Diemer, Peter, 4,351,742, Cl. 252-373.000.

Kubbeler, Hans K.; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, to Hoechst Aktiengesellschaft. Process for making anhydrous alkyl iodides. 4,351,972, Cl. 570-101.000.

Kubik, Hans. Sliding window or sliding door. 4,351,131, Cl. 49-501.000.

Kubo, Kyoji: *See*—
Shinoda, Naoharu; Maeda, Nobutaka; and Kubo, Kyoji, 4,351,650, Cl. 55-181.000.

Kubota, Ltd.: *See*—
Yoshida, Jituo; and Toyokuni, Kazuo, 4,351,196, Cl. 74-15.400.

Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Minagawa, Motonubu, to Adeka Argus Chemical Co., Ltd. 2,2,6,6-Tetramethyl-4-piperidyl spiro aliphatic ethers as stabilizers for synthetic polymers. 4,351,915, Cl. 524-103.000.

Kubota, Tetsumaru: *See*—
Matsuo, Kazumasa; and Kubota, Tetsumaru, 4,351,587, Cl. 350-255.000.

Kudo, Takeo: *See*—
Sugitani, Hatuo; Kudo, Takeo; Mukoyama, Yoshiyuki; and Kawai, Hiromasa, 4,351,910, Cl. 521-56.000.

Kumano, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard musical instrument with casing comprising two halves. 4,351,222, Cl. 84-423.00R.

Kunig, Helmut: *See*—
Jahnke, Joachim; Lehming, Gunther; Kunig, Helmut; and Nagel, Jens, 4,351,089, Cl. 19-129.00R.

Kuo, Chan-Hwa: *See*—
Patchett, Arthur A.; and Kuo, Chan-Hwa, 4,351,844, Cl. 424-279.000.

Kuppenheimer, John D., Jr.; and Baer, James W., to Sanders Associates, Inc. Laser crystal. 4,352,186, Cl. 372-41.000.

Kuramoto, Takaki: *See*—
Fujishima, Kunihiro; and Kuramoto, Takaki, 4,352,000, Cl. 219-10.770.

Kuraray Co., Ltd.: *See*—
Nakamura, Seishiro; and Tamura, Masuhiko, 4,351,964, Cl. 568-484.000.

Kurata, Masayuki; and Watanabe, Yushiyo, to Akebono Brake Industry Co., Ltd. Disc brake. 4,351,421, Cl. 188-73.450.

Kurihara, Keisuke, to Hitachi, Ltd. Production method for solder coated conductor wiring. 4,351,704, Cl. 204-15.000.

Kurihara, Yasutoshi; Hachino, Hiroaki; and Nakamura, Kousuke, to Hitachi, Ltd. Semiconductor device using SiC as supporter of a semiconductor element. 4,352,120, Cl. 357-81.000.

Kuriyama, Noboru, to Kabushiki Kaisha Tokuda Seisakusho. Sputter-etching device. 4,351,714, Cl. 204-298.000.

Kuroda, Osamu: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.

Kushi, Kenji: *See*—
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,351,881, Cl. 428-412.000.

Kusilek, LeRoy I., to Minnesota Mining and Manufacturing Company. Method of forming web material. 4,351,683, Cl. 156-167.000.

Kuwabara, Yasuo: *See*—
Horiba, Isao; Yanaka, Shigenobu; Kuwabara, Yasuo; and Koike, Kouichi, 4,352,020, Cl. 378-18.000.

Kuwako, Tomohisa, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electrical rotary machine. 4,352,036, Cl. 310-83.000.

Kwee, Henry T.: *See*—
Roberts, Charles W.; Lindner, Daniel J.; Kwee, Henry T.; Kolowski, Michael A.; and Fetty, Harold D., 4,351,381, Cl. 152-209.00R.

Kwiatkowski, Robert E.: *See*—
Du Pont, John P., Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., 4,352,139, Cl. 361-117.000.

Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, to Canon Kabushiki Kaisha. Ink jet printer with temperature compensation, 4,352,114, Cl. 346-140.00R.

Kyowa Chemical Industry Co., Ltd.: *See*—
Miyata, Shigeo; and Okada, Akira, 4,351,814, Cl. 423-306.000.

Kysela, Ernst: *See*—
Baasner, Bernd; Klauke, Erich; and Kysela, Ernst, 4,351,974, Cl. 570-174.000.

Labruyere, Gilles, to Societe Nationale Industrielle Aerospatiale. Foldable antenna reflector. 4,352,113, Cl. 343-915.000.

Lakin, Ira W.: *See*—
Fenton, Edward A., Jr.; Lakin, Ira W.; and Blair, Gilbert, 4,351,431, Cl. 198-823.000.

Landa, Benzion, to Savin Corporation. Microballistic printer. 4,351,617, Cl. 400-118.000.

Lange, Richard W.: *See*—
Du Pont, John P.; Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., 4,352,139, Cl. 361-117.000.

Langlais, Gerard: *See*—
Plantard, Dominique; Langlais, Gerard; and Fournier, Rene, 4,351,660, Cl. 65-5.000.

Langlois, Pierre; and Mollet, Marc. Vaginal tampon. 4,351,338, Cl. 128-285.000.

Lanier Business Products, Inc.: *See*—
Titus, Theodore, IV; and Bagley, Julius B., 4,352,173, Cl. 369-27.000.

Lansing Bagnall Limited: *See*—
Gibbons, Ralph D.; and Shackleford, Geoffrey G., 4,351,684, Cl. 156-215.000.

Lapointe, Roland R., to Joy Manufacturing Company. Drill. 4,351,399, Cl. 173-148.000.

Laporte, Joseph L. Counterweight system. 4,351,245, Cl. 108-136.000.

Laptev, Lev N.; Legotsky, Sergei S.; Semenovsky, Vladimir A.; Sambursky, Sergei S.; Litvinov, Abram B.; and Kondrashov, Alexei I. Refiner disk. 4,351,489, Cl. 241-261.300.

Larock, Richard C., to Iowa State University Research Foundation, Inc. Bicyclic prostaglandin analogs and method of synthesis. 4,351,949, Cl. 548-359.000.

Larson, Gary O.: *See*—
Foulks, Alan L.; and Larson, Gary O., 4,351,187, Cl. 73-178.00R.

Larson, Jay M.: *See*—
Worthen, Roger P.; and Larson, Jay M., 4,351,292, Cl. 123-188.0AA.

Latif, Chester C.: *See*—
Ferm, Richard L.; and Latif, Chester C., 4,351,750, Cl. 524-8.000.

Lau, Peter: *See*—
Kiessling, Werner; Wiedemann, Otto; Lau, Peter; and Vondrovsky, Gabriel, 4,351,497, Cl. 242-194.000.

Laures, Antoine. High-speed digital/analog converter. 4,352,093, Cl. 340-347.0DA.

Laverty, William F., to United Technologies Corporation. Labyrinth seal. 4,351,532, Cl. 277-53.000.

Lawrence, Randall K.; and Stevens, Aaron A., to Murray Ohio Manufacturing Co., The. Combined clutch and brake. 4,351,424, Cl. 192-18.00R.

Lawson, Michael B., to Halliburton Company. Method for removing iron sulfide scale from metal surfaces. 4,351,673, Cl. 134-3.000.

Lay, Larry D. Velocipede for the physically handicapped. 4,351,406, Cl. 180-65.00R.

Lazarus, Harrison; and Nelson, James A., to Lazarus, Harrison; and Nelson, James A. Peritoneal fluid treatment apparatus, package and method. 4,351,333, Cl. 128-214.400.

Learmonth, William H.: *See*—
Evans, Jonathan L.; and Learmonth, William H., 4,352,005, Cl. 219-121.0LJ.

Le Dieu, Bernard; and Herledan, Jean-Rene, to Compagnie Industrielle des Telecommunications CIT-ALCATEL. Device for synchronising multiplex lines in a time-division exchange. 4,352,181, Cl. 370-105.000.

Lee, Chien-Ping: *See*—
Yariv, Amnon; Margalit, Shlomo; and Lee, Chien-Ping, 4,352,116, Cl. 357-17.000.

Lee, Seung Y.: *See*—
Finlayson, James E., III; Holder, Joseph P.; Holt, L. Earl; and Lee, Seung Y., 4,351,638, Cl. 8-463.000.

Leff, Martin J.: *See*—
Flaum, Stephen S.; and Leff, Martin J., 4,351,264, Cl. 118-203.000.

Leggett & Platt, Incorporated: *See*—
Taylor, William B., 4,351,439, Cl. 211-49.00D.

Legotsky, Sergei S.: *See*—
Laptev, Lev N.; Legotsky, Sergei S.; Semenovsky, Vladimir A.; Sambursky, Sergei S.; Litvinov, Abram B.; and Kondrashov, Alexei I., 4,351,489, Cl. 241-261.300.

Lehming, Gunther: *See*—
Jahnke, Joachim; Lehming, Gunther; Kunig, Helmut; and Nagel, Jens, 4,351,089, Cl. 19-129.00R.

Lehrer, Harris I., to ICL Scientific. Polystyrene latex reagents, methods of preparation, and use in immunological procedures. 4,351,824, Cl. 424-12.000.

Leible, Erwin: *See*—
Stritt, Helmut; Schmidt, Alfred; and Leible, Erwin, 4,351,620, Cl. 403-13.000.

Leif, Robert C., to Coulter Electronics, Inc. Monitoring of a detection zone utilizing zero order radiation from a concave reflecting grating. 4,351,611, Cl. 356-328.000.

Leining, Lyndon R.; Fischer, Nathan A.; Simonson, Kent L.; White, Gordon G.; and Lindstrom, Oscar H., to Geo. A. Hormel & Company. Method and apparatus for removing skin from animal carcasses. 4,351,088, Cl. 17-50.000.

Leisner, Ernst: *See*—
Drexel, Peter; Maier, Gernot; and Leisner, Ernst, 4,351,628, Cl. 414-749.000.

Leiter, Bernd: *See*—
Steuer, Werner; and Leiter, Bernd, 4,351,569, Cl. 301-6.00V.

Lemanski, Michael F.: *See*—
Milberger, Ernest C.; Lemanski, Michael F.; and Spitnale, Gregory G., 4,351,773, Cl. 549-259.000.

Lemieux, George E.; and Tibbles, Tom T., to Ford Motor Company. Electronic and hydraulic control system for automatic gear change transmission. 4,351,206, Cl. 74-866.000.

Lemonnier, Jean, to Millipore Corporation. Test method and apparatus for the presence of microorganisms in ampoule. 4,351,900, Cl. 435-31.000.

Leonard, Frank W. Press. 4,351,233, Cl. 100-48.000.

Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; and Schlaich, Jorg. Reflector with air pressure means. 4,352,112, Cl. 343-915.000.

Lersmacher, Bernhard: *See*—
Hubner, Horst; Lersmacher, Bernhard; Lydtin, Hans; and Wilden, Rolf, 4,352,041, Cl. 374-144.000.

Lesage, Gaston. Machine for coiling strip material with a device for momentary immobilization of the tails of the strips. 4,351,687, Cl. 156-353.000.

Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. Pyridinyl-pyridines. 4,351,941, Cl. 546-258.000.

Lessig, William R., III, to Black & Decker Inc. Ground support system for a grass cutting machine. 4,351,143, Cl. 56-17.500.

L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre Nationale d'Etudes des Telecommunications): *See*—
Guillou, Louis C., 4,352,011, Cl. 235-375.000.

Leupold, Ernst I.: *See*—
Schmidt, Hans-Joachim; and Leupold, Ernst I., 4,351,908, Cl. 518-716.000.

Leussink, Reinhard: *See*—
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.

Leuthold, Oskar, to Ebauches Electroniques SA. Complementary MOS field effect transistor amplifier. 4,352,073, Cl. 330-264.000.

Levecque, Marc, administrator: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Battigelli, Jean A.; and Plantard, Dominique, 4,351,661, Cl. 65-5.000.

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Miller, Gene H., 4,351,554, Cl. 296-24.00R.

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Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,351,807, Cl. 423-24.000.
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Costello, Christopher, 4,351,299, Cl. 123-472.000.
Lucerne Products, Inc.: *See*—
Wied, Julius P., 4,351,581, Cl. 339-95.00D.
Lucitron, Inc.: *See*—
De Jule, Michael C., 4,352,101, Cl. 340-769.000.
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Kobler, Ingo, 4,351,386, Cl. 165-89.000.
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Miller, Geoffrey D., 4,352,201, Cl. 455-58.000.
Ma, John. Up-down frequency converter for cable T.V. 4,352,209, Cl. 455-315.000.
Maag Gear-Wheel & Machine Co. Ltd.: *See*—
Staedeli, Otto, 4,351,635, Cl. 440-75.000.
Maasberg, Wolfgang; and Huperz, Adalbert. Sealing arrangement for a piston pump. 4,351,531, Cl. 277-22.000.
Mach-Neal, Inc.: *See*—
Neal, Barry; and Morris, Timothy M., 4,351,517, Cl. 270-52.000.
Madden, Michael J., to Pomeco Corporation. High-security fill cap for underground storage tanks. 4,351,446, Cl. 220-210.000.
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Shinoda, Naoharu; Maeda, Nobutaka; and Kubo, Kyoji, 4,351,650, Cl. 55-181.000.
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Magee, Walter L., Jr., to Stauffer Chemical Company. Method for preparation of alkyl vanadates. 4,351,775, Cl. 260-429.00R.
Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,351,575, Cl. 308-3.800.
Magnaflux Corporation: *See*—
Garcia, Vilma A., 4,351,185, Cl. 73-104.000.
Mahaney, Robert A., to Champion Spark Plug Company. Glow plug. 4,351,291, Cl. 123-145.00A.
Mahle, Christoph E.: *See*—
Childs, William H.; and Mahle, Christoph E., 4,352,071, Cl. 329-105.000.
Mahoney, Paul F.; and Bonn, Jerrold L., to Signatron, Inc. Signal processing circuitry. 4,352,029, Cl. 307-317.00R.
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Hasegawa, Hiroshi; and Maida, Osamu, 4,351,600, Cl. 354-60.00L.
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Maillefer S.A.: *See*—
Hochstrasser, Ulrich; and Kertscher, Eberhard, 4,351,790, Cl. 264-174.000.
Majewski, Edward. Bowl for maintaining liquids and solid foods separate. 4,351,444, Cl. 220-20.000.
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Johansson, Bengt; Keinonen, Arno; and Makinen, Eero, 4,351,255, Cl. 114-41.000.
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Furukawa, Yuji; and Sato, Makoto, 4,351,574, Cl. 308-3.00A.
Malhotra, Sudarshan K., to Dow Chemical Co., The. Production of 6-(chloro or substituted phenoxy)-2-di-(substituted phenoxy)methyl pyridines. 4,351,943, Cl. 546-301.000.
Malik, Marvin J., to General Motors Corporation. Vehicle drive system with energy storage and retrieval. 4,351,409, Cl. 180-165.000.
Mallouk, Robert S.: *See*—
Parish, Darrell J.; and Mallouk, Robert S., 4,351,746, Cl. 252-511.000.
MAN Maschinenfabrik Augsburg-Nurnberg AG: *See*—
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Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,352,172, Cl. 368-76.000.
Mangutov, Rafael A.: *See*—
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Manizza, Guelfo A., to Federal Paper Board Co., Inc. Tray container with tear out cover. 4,351,473, Cl. 229-43.000.
Manley, Paul W.: *See*—
Fellner, Peter J.; Hamill, Brendan J.; and Manley, Paul W., 4,351,948, Cl. 548-336.000.
Mann, Friedrich; and Negro, Guido, to Bielomatik Leuze GmbH + Co. Apparatus for producing coils. 4,351,371, Cl. 140-92.300.
Manna, Daniel C.: *See*—
Mueller, Paul; Manna, Daniel C.; and Prine, Ray A., 4,351,271, Cl. 119-14.090.
Mannesmann Tally Corporation: *See*—
Bringhurst, Edward D., 4,351,235, Cl. 101-93.040.
Mansbridge, Martin H.: *See*—
Swadling, Sidney J.; Mansbridge, Martin H.; Payne, Dennis J.; and Norton, John, 4,351,470, Cl. 228-157.000.
Marburger, Ben; and Mogonye, Marjorie. Adjustable toy spring horse. 4,351,522, Cl. 272-52.000.
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Maremont Corporation: *See*—
Curtis, George F., 4,351,224, Cl. 89-37.0BA.
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Yariv, Amnon; Margalit, Shlomo; and Lee, Chien-Ping, 4,352,116, Cl. 357-17.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, to Texaco, Inc. Partial oxidation burner apparatus. 4,351,645, Cl. 48-61.000.
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Marshall, Alan, to Ciba-Geigy Corporation. Method for scale control. 4,351,796, Cl. 422-15.000.
Marsoner, Hermann; List, Helmut; and Kleinhappl, Erich, to List, Hans. Analyzing apparatus for liquid samples. 4,351,798, Cl. 422-63.000.
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Whitney, Douglass G.; and Martin, John K., III, 4,351,332, Cl. 128-214.00F.
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Martin, Pierre; Steiner, Eginhard; and Bellus, Daniel, to Ciba-Geigy Corporation. 2-(2',2'-Dichloro-3',3',3'-trifluoropropyl)- and 2-(2',2',3'-trichloro-3',3'-difluoropropyl)-4-chlorocyclobutan-1-ones. 4,351,961, Cl. 568-381.000.
Martinengo, PierCarlo; Giachello, Angelo; Tommasini, Giuseppe; and Popper, Paul, to Fiat Societa per Azioni. Process for sintering reaction bonded silicon nitride. 4,351,787, Cl. 264-65.000.
Martinez, Richard I.; and Herron, John T., to United States of America, Commerce. Method for removing sulfur dioxide from a gas stream. 4,351,810, Cl. 423-235.000.
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Maruyama, Eiichi: *See*—
Matsui, Makoto; Shiraki, Yasuhiro; Katayama, Yoshifumi; Tsukada, Toshihisa; and Maruyama, Eiichi, 4,351,856, Cl. 427-38.000.

Masaki, Kenji; and Saito, Masaki, to Nissan Motor Company Limited. Fuel injection valve for an automotive vehicle. 4,351,480, Cl. 239-585.000.

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Knecht, Siegfried H., 4,351,463, Cl. 226-154.000.

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Ersoy, Metin; and Weber, Albrecht, 4,351,516, Cl. 269-27.000.

Maskinfirma Certus AB: *See*—
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Clark, John I.; Mengel, Loretta S.; and Benedek, George B., 4,351,826, Cl. 424-81.000.
Growdon, John H.; and Wurtman, Richard J., 4,351,831, Cl. 424-199.000.
Suh, Nam P.; Senturia, Stephen D.; and Kim, Byung H., 4,352,059, Cl. 324-61.00R.

Massey, Stewart R.: *See*—
Baylis, Michael A.; Harris, Peter; and Massey, Stewart R., 4,351,802, Cl. 422-89.000.

Mastumoto, Fuyuhiko: *See*—
Ohori, Tamio; Mastumoto, Fuyuhiko; and Tomita, Satoru, 4,352,128, Cl. 358-294.000.

Masuda, Eiji; and Kawasaki, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital to analog converter. 4,352,092, Cl. 340-347.0DA.

Masuda, Naomasa: *See*—
Iwata, Mitsuo; Masuda, Naomasa; Uraki, Hideki; and Tsuchino, Kunio, 4,351,498, Cl. 242-204.000.

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Fukushima, Madoka; Akita, Kin-ichiro; and Masuda, Yoshihisa, 4,351,188, Cl. 73-189.000.

Materne, Carsten, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine-3,5-dicarboxylate-4-carboxamide compounds, compositions containing same and method of using same. 4,351,837, Cl. 424-266.000.

Mathis, Ronald R. Rack for laying Italian and quarry tile. 4,351,694, Cl. 156-574.000.

Matlock, Gordon E.: *See*—
Moehlenpah, Walter G.; and Matlock, Gordon E., 4,351,465, Cl. 227-7.000.

Matrone, John L., to Fairchild Camera & Instrument Corp. Universal test fixture employing interchangeable wired personalizers. 4,352,061, Cl. 324-158.00F.

Matsuda, Mutsuhide: *See*—
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,351,598, Cl. 354-288.000.
Suzuki, Toyotosi; Matsuda, Mutsuhide; and Tamamura, Hideo, 4,351,599, Cl. 354-288.000.

Matsuda, Shinpei; Kato, Akira; Uno, Shigeo; Sakuta, Youichi; and Nakajima, Fumito, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki-Kaisha. Process for reducing an eliminating nitrogen oxides in an exhaust gas. 4,351,811, Cl. 423-239.000.

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Matsui, Sadaki: *See*—
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Matsumoto, Fuyuhiko: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, 4,351,604, Cl. 355-4.000.

Matsumoto, Hiroshi: *See*—
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Matsumoto, Kimiichiro; Miyake, Hajimu; and Suga, Hisashi, to Ono Pharmaceutical Co., Ltd. 3-Hydroxy and 3-oxo-prostaglandin analogues. 4,351,846, Cl. 424-305.000.

Matsumura, Shizuo: *See*—
Koiwai, Hideshi; Matsumura, Shizuo; and Kawasaki, Haruhiko, 4,351,356, Cl. 137-491.000.

Matsumura, Shunichi; Inata, Hiroo; and Morinaga, Tsuto, to Teijin Limited. Method for reducing the terminal carboxyl group content of a saturated polyester, a saturated polyester having a reduced terminal carboxyl group content, and a molded article composed of such a saturated polyester. 4,351,936, Cl. 528-289.000.

Matsuo, Kazumasa; and Kubota, Tetsumaru, to Olympus Optical Company, Ltd. Apparatus for positioning eyepiece of endoscope. 4,351,587, Cl. 350-255.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Itoh, Masashi, 4,352,176, Cl. 369-170.000.
Nagamoto, Shunichi; Ito, Masao; Saka, Tatsuo; and Kobayashi, Tetsu, 4,351,999, Cl. 219-10.55B.
Nyuji, Tomoaki; Kawasaki, Itaru; Noguchi, Masahiro; and Tsukamoto, Masahide, 4,352,162, Cl. 364-724.000.

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Takagi, Hiromitsu; Umebachi, Shotaro; Kano, Gota; and Teramoto, Iwao, 4,351,099, Cl. 29-571.000.

Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Apparatus for high temperature electrodialysis. 4,351,715, Cl. 204-301.000.

Matthews, Leslie N. Boat hull. 4,351,262, Cl. 114-284.000.

Matthews, Ralph E. Apparatus for attaching a firescreen to a fireplace. 4,351,317, Cl. 126-139.000.

Mattisson, Lennart; and Ganrot, Bertil, to Societe d'Assistance Technique pour Porduits Nestle S.A. Food package. 4,351,997, Cl. 219-10.55E.

Maudal, Inge; Wedertz, Larry D.; and Yost, Kenneth M., to General Dynamics. Double fabric, retractable, self-erecting wing for missle. 4,351,499, Cl. 244-3.270.

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Weppner, Werner, 4,352,068, Cl. 324-452.000.

May, Adolf: *See*—
Billenstein, Siegfried; May, Adolf; and Bucking, Hans-Walter, 4,351,737, Cl. 252-8.800.

Mayer, Norbert: *See*—
Hieber, Konrad; and Mayer, Norbert, 4,351,695, Cl. 156-603.000.

Maynard, Walter P., Jr. Liquid container having stacking feature. 4,351,454, Cl. 222-143.000.

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Boudot, Jean E.; Mazeau, Jean P.; and Michaud, Andre C., 4,351,906, Cl. 501-74.000.

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Stephen, James H.; McCann, John D.; and Flemming, Michael A., 4,352,098, Cl. 340-572.000.

McCartney, Charles P., Jr.; and Wheadon, Ellis G., to General Motors Corporation. Lead-acid storage battery plate and method of making same. 4,351,891, Cl. 429-225.000.

McCartney, Thomas, to ONEAC Corporation. AC Variable voltage source utilizing pulse width modulation. 4,352,055, Cl. 323-263.000.

McClocklin, Samuel B.: *See*—
Solie, James C.; and McClocklin, Samuel B., 4,351,362, Cl. 137-625.650.

McCollum, Anthony W.; Edmonson, William L.; and Belote, Stephen N., to Eastman Kodak Company. Glycolized polyesters. 4,351,927, Cl. 525-437.000.

McCormick & Company, Incorporated: *See*—
Costamagna, Robert M.; Mori, Denis W.; and Bardett, Allen R., 4,351,850, Cl. 426-302.000.

McCubbin, Melvin J.; and Johnson, Clifford T., to United States of America, Navy. Warhead, incendiary. 4,351,239, Cl. 102-364.000.

McCubbin, Melvin J.; Johnson, Clifford T.; and Cordle, Paul E., to United States of America, Navy. Incendiary fragmentary warhead. 4,351,240, Cl. 102-364.000.

McDonald, Richard. Anti-crushing bar assembly for pig farrowing crates. 4,351,272, Cl. 119-20.000.

McDonnell Douglas Corporation: *See*—
Calhoun, Leslie D.; and Peeples, Marion E., 4,351,388, Cl. 165-104.260.

McDowell, Donald J., to Felt Products Mfg. Co. Abrasive-erosion resistant gasket assembly. 4,351,534, Cl. 277-235.00B.

McElroy, Jerry W., to Emerson Electric Co. Removable snap-on actuators for program timer dial. 4,351,200, Cl. 74-568.00T.

McGinley Mills, Inc.: *See*—
McGinley, Thomas F., 4,351,367, Cl. 139-11.000.

McGinley, Thomas F., to McGinley Mills, Inc., a part interest. Beat-up system. 4,351,367, Cl. 139-11.000.

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Gilker, Clyde, 4,352,138, Cl. 361-92.000.

McGuire, Hugh K., to CASCO Inc. Flexible duct forming apparatus and method. 4,351,682, Cl. 156-143.000.

McInturff, Ace: *See*—
Verderber, Joseph A.; Fortcamp, James A.; McInturff, Ace; and Rose, Denis A., 4,352,012, Cl. 235-487.000.

McJunkin Corporation: *See*—
McJunkin, Howard P., Jr.; and Rowley, Larry W., 4,352,148, Cl. 362-61.000.

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McKindary, Thomas W., to Zimmer Manufacturing Corp. Shear cut tooth. 4,351,210, Cl. 83-835.000.

McLeod, Syble A. Panty liner construction. 4,351,340, Cl. 128-288.000.

McMillan, William J.; and Severson, Jerry L., to Dow Chemical Company, The. Roof construction and method thereof. 4,351,138, Cl. 52-309.400.

McNairy, James A.; and Fitzgerald, John B., to ACF Industries, Inc. By-pass valve. 4,351,151, Cl. 60-290.000.

McVey, John K.; and Wanatowicz, Edward W., Jr., to Illinois Tool Works Inc. Capacitive keyswitch with overtravel plunger mechanism. 4,352,144, Cl. 361-288.000.

Mead Corporation, The: *See*—
Hutchins, Ferris L., Jr., 4,351,246, Cl. 108-156.000.
Suttles, James M., 4,351,244, Cl. 108-107.000.

Mead, Harold C., to Nixdorff Krein Industries, Inc. Versatile fast hitch side mounting of agricultural spray tanks. 4,351,535, Cl. 280-5.00R.

Mead Johnson & Company: *See*—
Simms, Jack C., deceased; and Old National Bank in Evansville, administrator, 4,351,939, Cl. 544-230.000.

Meade, Reginald E., to DEC International. Foraminous mat products. 4,351,849, Cl. 426-61.000.

Meaden, Douglas G.: *See*—
Barber, Donald J.; and Meaden, Douglas G., 4,351,433, Cl. 206-264.000.

Mechalas, Emmanuel. System of apparatus for filling bags with dry powder. 4,351,373, Cl. 141-51.000.

Mechtron International Corp.: *See*—
Brashears, David F., 4,351,251, Cl. 110-261.000.

Megy, Joseph A.; and Hard, Robert A., to Occidental Research Corporation. Process for reducing phosphate ore. 4,351,809, Cl. 423-167.000.

Megy, Joseph A.; and Hard, Robert A., to Occidental Research Corporation. Process for producing phosphorus pentoxide or phosphorus or phosphoric acid. 4,351,813, Cl. 423-304.000.

Meiji Seika Kaisha, Ltd.: *See*—
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.

Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,351,379, Cl. 144-365.000.

Meisenheimer, Daniel T., Jr. Frangible connectors with independently selectable bending and tension separation loads. 4,351,352, Cl. 137-68.00R.

Melchior, Jean. Internal combustion engine with improved efficiency and filling by recovery of part of the energy of the blasts which are produced during the opening of the exhaust ports. 4,351,290, Cl. 123-59.0BM.

Memorex Corporation: *See*—
Osborne, John R., 4,351,698, Cl. 156-661.100.

Mengel, Loretta S.: *See*—
Clark, John I.; Mengel, Loretta S.; and Benedek, George B., 4,351,826, Cl. 424-81.000.

Mennesson, Paul; and Moreau, Hugues. Flexible strip facing material and method and apparatus for cutting the material. 4,351,866, Cl. 428-60.000.

Merck & Co., Inc.: *See*—
Patchett, Arthur A.; and Kuo, Chan-Hwa, 4,351,844, Cl. 424-279.000.

Merten, Jeff L., to ACF Industries, Incorporated. Lubricant fitting. 4,351,414, Cl. 184-105.00B.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Kranz, Walter; and Tillmann, Heinz, 4,351,479, Cl. 239-265.230.

Metzner, Robert G.: *See*—
Fields, Gerald M.; and Metzner, Robert G., 4,351,405, Cl. 180-65.00A.

Meunier, Georges, to Isover Saint-Gobain. Apparatus and method for drying compact, vitrifiable mixtures. 4,351,119, Cl. 34-28.000.

Michaud, Andre C.: *See*—
Boudot, Jean E.; Mazeau, Jean P.; and Michaud, Andre C., 4,351,906, Cl. 501-74.000.

Michelucci, John: *See*—
Hurwitz, Arthur; Michelucci, John; and Krupey, John, 4,351,158, Cl. 62-60.000.

Michiguchi, Yoshihiro: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Michno, Michael J., Jr.: *See*—
Ballintyn, Nicolaas J.; and Michno, Michael J., Jr., 4,351,069, Cl. 3-1.912.

Middleman, Lee M.; Evans, Joseph H.; Blake, Arthur E.; and Scheff, Victor A., to Raychem Corporation. Circuit protection devices. 4,352,083, Cl. 338-23.000.

Midrex Corporation: *See*—
Sanzenbacher, Charles W., 4,351,513, Cl. 266-156.000.

Miehe, Friedrich V.: *See*—
Unglaube, Uwe; and Miehe, Friedrich V., 4,352,096, Cl. 340-815.060.

Milberger, Ernest C.; Lemanski, Michael F.; and Spitnale, Gregory G., to Standard Oil Company, The. Preparation of maleic anhydride from butane using fluidized vanadium-phosphorous-oxide containing catalysts. 4,351,773, Cl. 549-259.000.

Milia, Louis. Sieve assembly for cleaning bodies and heat exchanger system including same. 4,351,387, Cl. 165-95.000.

Miller, Dennis L.: *See*—
Rarig, Larry L.; Alleman, Raymond A.; and Miller, Dennis L., 4,351,263, Cl. 118-665.000.

Miller, Gene H., to Livlab, Inc. Motor vehicle sleeper unit. 4,351,554, Cl. 296-24.00R.

Miller, Geoffrey D., to M.L. Engineering (Plymouth) Limited. Data transmission system. 4,352,201, Cl. 455-58.000.

Miller, William J.; and Trbovich, Nick G., to Racal-Milgo, Inc. RSA Public-key data encryption system having large random prime number generating microprocessor or the like. 4,351,982, Cl. 178-22.110.

Milliken Research Corporation: *See*—
Eschenbach, Paul W., 4,351,148, Cl. 57-209.000.
Kluger, Edward W.; and Welch, Calvin D., 4,351,934, Cl. 528-111.000.

Milliner, Ken: *See*—
Sexstone, John H.; Lewis, Tom; and Milliner, Ken, 4,351,792, Cl. 264-293.000.

Millipore Corporation: *See*—
Lemonnier, Jean, 4,351,900, Cl. 435-31.000.

Milne, Robert, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Antenna beam shaping structure employing dipoles arrayed on a parabolic surface. 4,352,108, Cl. 343-756.000.

Minagawa, Motonubu: *See*—
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Minagawa, Motonubu, 4,351,915, Cl. 524-103.000.

Ministry of International Trade & Industry: *See*—
Muramatsu, Hiroshige; and Ueda, Teruo, 4,351,954, Cl. 562-574.000.

Minitube NYA AB: *See*—
Farnstrom, Sven E.; and Andersson, Hans, 4,351,616, Cl. 374-209.000.

Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheelchair construction. 4,351,540, Cl. 280-242.0WC.

Minnesota Mining and Manufacturing Company: *See*—
Kusilek, LeRoy I., 4,351,683, Cl. 156-167.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishida, Tokuji; and Sahara, Masayoshi, 4,351,594, Cl. 354-139.000.

Minotti, Peter L. Pipe repair kit apparatus and method. 4,351,349, Cl. 137-15.000.

Mirviss, Stanley B.: *See*—
Giolito, Silvio L.; and Mirviss, Stanley B., 4,351,780, Cl. 260-974.000.

Mita, Yoichi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,352,174, Cl. 369-77.000.

Mitchell, Charles T. Ocean bottom sampler. 4,351,127, Cl. 43-9.000.

Mitchell, Richard F.: *See*—
Davis, Christopher K.; and Mitchell, Richard F., 4,352,183, Cl. 371-33.000.

Mitsubishi Chemical Industries Limited: *See*—
Muroi, Kaname; and Fujino, Hiroko, 4,351,744, Cl. 252-408.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Komurasaki, Satoshi; and Ueda, Atsushi, 4,351,307, Cl. 123-618.000.
Terazono, Narihiro; and Kajiyama, Ryuichi, 4,351,416, Cl. 187-29.00R.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Shinoda, Naoharu; Maeda, Nobutaka; and Kubo, Kyoji, 4,351,650, Cl. 55-181.000.

Mitsubishi Petrochemical Company Limited: *See*—
Doi, Shuhei; Isaka, Tsutomu; and Iida, Shinichiro, 4,351,876, Cl. 428-349.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,351,881, Cl. 428-412.000.
Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, 4,351,751, Cl. 524-375.000.
Kishida, Kazuo; Hasegawa, Akira; and Kawachi, Yasunori, 4,351,921, Cl. 525-80.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Nishimura, Tadahiko; Yamamoto, Hiroshi; Osuo, Masatoshi; and Kanazawa, Akio, 4,351,967, Cl. 568-754.000.
Takahata, Kazunori; and Taniguchi, Katsuo, 4,351,958, Cl. 564-409.000.

Mitsui, Tadashi; Wasaki, Masaru; and Ohta, Junpei, to TDK Electronics Co., Ltd. Ferrite core. 4,352,080, Cl. 336-83.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Kanemaru, Muneaki; Yoshida, Kenji; Higashino, Thikashi; and Kozima, Tadashi, 4,351,971, Cl. 568-898.000.

Mixon, James A., to American Enviro-Port, Inc. Water treatment plant. 4,351,722, Cl. 210-195.300.

Miyahara, Takashi, to Nippon Seiko Kabushiki Kaisha. Clutch release bearing assembly provided with a self-centering mechanism. 4,351,427, Cl. 192-98.000.

Miyake, Hajimu: *See*—
Matsumoto, Kimiichiro; Miyake, Hajimu; and Suga, Hisashi, 4,351,846, Cl. 424-305.000.

Miyake, Masayuki; Sekino, Takeo; and Takeda, Masashi, to Sony Corporation. Shift register. 4,352,027, Cl. 307-221.00R.

Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, to Nippon Zeon Co. Ltd.; and Victor Company of Japan Limited. Information signal record medium of the capacitance type. 4,351,747, Cl. 252-511.000.

Miyao, Masanobu: *See*—
Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, 4,351,674, Cl. 148-1.500.

Miyata, Shigeo; and Okada, Akira, to Kyowa Chemical Industry Co., Ltd. Hydrotalcites having a hexagonal needle-like crystal structure and process for production thereof. 4,351,814, Cl. 423-306.000.

Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, to Meiji Seika Kaisha, Ltd. Polymeric compound, MF-300, with protective activity against bacterial infections and its preparation. 4,351,830, Cl. 424-180.000.

Mizuta, Toshiaki; Abe, Takeshi; Yoshihara, Ichiro; and Saito, Kazuhito, to Ricoh Company, Ltd. Remote meter reading apparatus. 4,352,104, Cl. 340-825.150.

Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Chu, Yung F., 4,351,979, Cl. 585-481.000.
Jaffe, Stephen B., 4,351,717, Cl. 208-216.0PP.
Robertson, Arthur B., 4,351,884, Cl. 204-159.120.
Yan, Tsoung-yuan; and Espenscheid, Wilton F., 4,351,566, Cl. 299-5.000.

Mochizuki, Masafumi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,352,174, Cl. 369-77.000.

Mochizuki, Yasuhiro; Wakui, Yoko; and Hachino, Hiroaki, to Hitachi, Ltd. Method of manufacturing semiconductor device having aluminum diffused semiconductor substrate. 4,351,677, Cl. 148-188.000.

Moehlenpah Industries, Inc.: *See*—
Moehlenpah, Walter G.; and Matlock, Gordon E., 4,351,465, Cl. 227-7.000.

Moehlenpah, Walter G.; and Matlock, Gordon E., to Moehlenpah Industries, Inc. Apparatus for end-plating railroad ties. 4,351,465, Cl. 227-7.000.

Mogonye, Marjorie: *See—*
Marburger, Ben; and Mogonye, Marjorie, 4,351,522, Cl. 272-52.000.

Mojden, Wallace W., to Fleetwood Systems, Inc. Magnetic rail construction for can conveyor. 4,351,430, Cl. 198-690.000.

Molin, Roland, to PR Processutveckling AB. Machine for cleaning vertical or inclined surfaces. 4,351,132, Cl. 51-180.000.

Molins PLC: *See—*
Barber, Donald J.; and Meaden, Douglas G., 4,351,433, Cl. 206-264.000.

Moll, Hans, to MAN Maschinenfabrik Augsburg-Nurnberg AG. Articulated vehicle. 4,351,408, Cl. 180-135.000.

Mollet, Marc: *See—*
Langlois, Pierre; and Mollet, Marc, 4,351,338, Cl. 128-285.000.

Monma, Yoshiyuki: *See—*
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Monsanto Company: *See—*
Baizer, Manuel M.; and Goodin, Richard D., 4,351,951, Cl. 560-186.000.
Chupp, John P., 4,351,667, Cl. 71-118.000.
Tokas, Edward F., 4,351,923, Cl. 525-250.000.

Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Process for liming pelts of animal hides and skins. 4,351,639, Cl. 8-94.160.

Montabord, Lucien: *See—*
Bonavent, Gerard; and Montabord, Lucien, 4,351,642, Cl. 23-230.00M.

Montedison S.p.A.: *See—*
Foa, Marco; Moro, Alessandro; Gardano, Andrea; and Cassar, Luigi, 4,351,952, Cl. 562-406.000.

Montefiore Hospital: *See—*
Stanko, Ronald T., 4,351,835, Cl. 424-252.000.

Montel, Jacques: *See—*
Moutou, Paul C.; and Montel, Jacques, 4,352,115, Cl. 357-13.000.

Moore, Curtis L., to Electric Power Research Institute, Inc. Combination static plate and liquid distribution manifold for electrical inductive apparatus. 4,352,078, Cl. 336-60.000.

Moore, John A., to Caterpillar Tractor Co. Face seal with rotatable seal ring. 4,351,533, Cl. 277-83.000.

Morbark Industries, Inc.: *See—*
Morey, Larry L., 4,351,719, Cl. 209-234.000.

Moreau, Hugues: *See—*
Mennesson, Paul; and Moreau, Hugues, 4,351,866, Cl. 428-60.000.

Moreton, Neal S. Acoustical transmission wave guide assembly for predicting failure of structured members. 4,352,038, Cl. 310-323.000.

Moretto, Hans-Heinrich: *See—*
Steinberger, Helmut; Moretto, Hans-Heinrich; Kortmann, Wilfried; and Pfeiffer, Josef, 4,351,736, Cl. 252-8.600.

Morey, Larry L., to Morbark Industries, Inc. Vibrating screen apparatus. 4,351,719, Cl. 209-234.000.

Mori, Denis W.: *See—*
Costamagna, Robert M.; Mori, Denis W.; and Bardett, Allen R., 4,351,850, Cl. 426-302.000.

Mori, Hiroshi: *See—*
Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, 4,351,751, Cl. 524-375.000.

Mori, Keiji: *See—*
Kanou, Noboru; and Mori, Keiji, 4,351,560, Cl. 296-216.000.

Moriga, Hiroyuki: *See—*
Takahashi, Masao; Yoshida, Katumi; Ohwaki, Shinji; and Moriga, Hiroyuki, 4,351,738, Cl. 252-8.750.

Morigaki, Masakazu: *See—*
Aoki, Kozo; Seto, Nobuo; Yabuki, Yoshiharu; Morigaki, Masakazu, Furutachi, Nobuo; and Nakamura, Kotaro, 4,351,897, Cl. 430-555.000.

Morinaga, Tsuto: *See—*
Matsumura, Shunichi; Inata, Hiroo; and Morinaga, Tsuto, 4,351,936, Cl. 528-289.000.

Morishita, Teru: *See—*
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,351,482, Cl. 239-703.000.

Morita, Masayuki; and Nakano, Tasuku, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Direction indicator blinker light switching arrangement. 4,351,991, Cl. 200-61.270.

Moro, Alessandro: *See—*
Foa, Marco; Moro, Alessandro; Gardano, Andrea; and Cassar, Luigi, 4,351,952, Cl. 562-406.000.

Morozov, Gennady Y.: *See—*
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.

Morris, Timothy M.: *See—*
Neal, Barry; and Morris, Timothy M., 4,351,517, Cl. 270-52.000.

Morrison-Knudsen Company, Inc.: *See—*
Loire, Rene, 4,351,259, Cl. 114-230.000.

Morton, David C. Portable heater. 4,351,314, Cl. 126-59.000.

Morton, Kenneth E. Apparatus for analyzing a fish population. 4,351,438, Cl. 209-675.000.

Mosa, B.V.: *See—*
Schreurs, Gustaaf J., 4,351,788, Cl. 264-67.000.

Moser, Reinhard: *See—*
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Motorola, Inc.: *See—*
Beesley, Graham E., 4,352,030, Cl. 307-350.000.
Cave, David L.; Harris, Steven L.; and Zobel, Don W., 4,352,056, Cl. 323-314.000.
Schroeder, Daniel R., 4,352,208, Cl. 455-266.000.

Moulin, Pierre A., to Schlumberger Technology Corporation. Apparatus for conduit free-point detection in boreholes. 4,351,186, Cl. 73-151.000.

Moulton, Lee J., to Hawaiian Motor Company. Oscillating powered cultivating tool. 4,351,396, Cl. 172-40.000.

Moutner, David N.: *See—*
Brickner, Laurence R.; Moutner, David N.; and Pratt, Barbara J., 4,351,230, Cl. 98-31.000.

Moutou, Paul C.; and Montel, Jacques, to Thomson-CSF. Transit time diode with an input structure formed by a matrix of micropoints. 4,352,115, Cl. 357-13.000.

Mowe, Wayne T.: *See—*
Blackmon, Lawrence E.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,351,147, Cl. 57-208.000.

Mozingo, Robert E., to J. I. Case Company. Cover plate arrangement. 4,351,199, Cl. 74-566.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
Zacherl, Anton, 4,351,577, Cl. 308-189.00R.

Mueller, Alvin W., to Mueller-Perry Co., Inc. Method for making a stress-relieved composite foamed resin baseball bat or bowling pin. 4,351,786, Cl. 264-46.700.

Mueller, Dale A.; and Sperry, Timothy P., to Honeywell Inc. High voltage ignition transformer. 4,352,079, Cl. 336-65.000.

Mueller, Frederick N. Truck body construction. 4,351,558, Cl. 296-187.000.

Mueller, Paul; Manna, Daniel C.; and Prine, Ray A., to Paul Mueller Company. Refrigerated receiver. 4,351,271, Cl. 119-14.090.

Mueller-Perry Co., Inc.: *See—*
Mueller, Alvin W., 4,351,786, Cl. 264-46.700.

Mueller, William A.: *See—*
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Mukoyama, Yoshiyuki: *See—*
Sugitani, Hatuo; Kudo, Takeo; Mukoyama, Yoshiyuki; and Kawai, Hiromasa, 4,351,910, Cl. 521-56.000.

Mulvey, Robert F.; and Crepeau, Charles E., to General Electric Co. Thermal insulation composite of cellular cementitious material. 4,351,867, Cl. 428-70.000.

Munnekehoff, Gerd: *See—*
Schippers, Heinz; Munnekehoff, Gerd; and Teich, Udo, 4,351,494, Cl. 242-35.50A.

Murai, Shinichi: *See—*
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Murakami, Masahiro: *See—*
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,351,947, Cl. 548-251.000.

Murakami, Yasushi: *See—*
Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, 4,351,834, Cl. 424-249.000.

Muramatsu, Hiroshige; and Ueda, Teruo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Halogenated α-amino acids. 4,351,954, Cl. 562-574.000.

Muramoto, Eiichi: *See—*
Fujiwara, Yasuo; Maeo, Hidemi; and Muramoto, Eiichi, 4,351,572, Cl. 305-27.000.

Murao, Yutaka: *See—*
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,352,157, Cl. 364-200.000.

Murayama, Stanley T.: *See—*
Gradeff, Peter S.; and Murayama, Stanley T., 4,351,962, Cl. 568-432.000.

Muroi, Kaname; and Fujino, Hiroko, to Mitsubishi Chemical Industries Limited. Karl-Fischer Reagent. 4,351,744, Cl. 252-408.000.

Murray Machinery, Inc.: *See—*
Haller, Jack R.; and Haselton, William M., 4,351,487, Cl. 241-92.000.

Murray Ohio Manufacturing Co., The: *See—*
Lawrence, Randall K.; and Stevens, Aaron A., 4,351,424, Cl. 192-18.00R.

Musashi Co., Ltd.: *See—*
Tanaka, Shigeru, 4,351,520, Cl. 271-315.000.

Myers, Allen: *See—*
Reynolds, Richard W.; Myers, Allen; and Foley, Daniel J., 4,351,152, Cl. 60-395.000.

Nagai, Kiyokazu, to Chugairo Kogyo Kaisha Ltd. Burner with suppressed NO_x generation. 4,351,632, Cl. 431-183.000.

Nagai, Yohei: *See—*
Okamoto, Shimaji; and Nagai, Yohei, 4,351,212, Cl. 84-1.010.

Nagamoto, Shunichi; Ito, Masao; Saka, Tatsuo; and Kobayashi, Tetsu, to Matsushita Electric Industrial Co., Ltd. Heating apparatus provided with a voice synthesizing circuit. 4,351,999, Cl. 219-10.55B.

Nagasawa, Takeshi: *See—*
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,351,609, Cl. 355-50.000.

Nagashima, Toshio: *See—*
Saitoh, Takeshi; Hatashita, Hiroshi; Nagashima, Toshio; and Yamamoto, Susumu, 4,352,076, Cl. 333-204.000.

Nagel, Jens: *See—*
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Nakagawa, Hiroyuki: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,351,765, Cl. 260-163.000.
Nakajima, Fumito: *See*—
Matsuda, Shinpei; Kato, Akira; Uno, Shigeo; Sakuta, Youichi; and Nakajima, Fumito, 4,351,811, Cl. 423-239.000.
Nakamura, Kotaro: *See*—
Aoki, Kozo; Seto, Nobuo; Yabuki, Yoshiharu; Morigaki, Masakazu; Furutachi, Nobuo; and Nakamura, Kotaro, 4,351,897, Cl. 430-555.000.
Nakamura, Kousuke: *See*—
Kurihara, Yasutoshi; Hachino, Hiroaki; and Nakamura, Kousuke, 4,352,120, Cl. 357-81.000.
Nakamura, Mamoru: *See*—
Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, 4,351,747, Cl. 252-511.000.
Nakamura, Seishiro; and Tamura, Masuhiko, to Kuraray Co., Ltd. Process for producing acetaldehyde. 4,351,964, Cl. 568-484.000.
Nakamura, Takanori: *See*—
Shindome, Mamoru; Yanagita, Takanori; Nakamura, Takanori; and Otsuji, Hiroyuki, 4,351,252, Cl. 110-346.000.
Nakano, Tasuku: *See*—
Morita, Masayuki; and Nakano, Tasuku, 4,351,991, Cl. 200-61.270.
Nakao, Kazumune: *See*—
Hatano, Yasuhiro; and Nakao, Kazumune, 4,351,978, Cl. 585-469.000.
Nakata, Shinichi: *See*—
Hirano, Reiji; and Nakata, Shinichi, 4,352,161, Cl. 364-706.000.
Nalley, David J., to Singer Company, The. Sabre saw bar and blade holder. 4,351,112, Cl. 30-392.000.
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, to Tokyo Shibaura Electric Co., Ltd. Data-processing apparatus having improved interrupt handling processor. 4,352,157, Cl. 364-200.000.
Nanos, Ralph G.: *See*—
Argyle, Charles S.; and Nanos, Ralph G., 4,351,390, Cl. 165-149.000.
Naoi, Takayuki: *See*—
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, 4,351,576, Cl. 308-37.000.
Napholcz, Johannes: *See*—
Hunold, Klaus; Reinmuth, Klaus; Lipp, Alfred; Napholcz, Johannes; and Arnold, Peter, 4,351,858, Cl. 427-193.000.
Nashua Corporation: *See*—
Cormier, Raymond G.; and Gibbs, John D., 4,351,601, Cl. 355-3.0SH.
Nation, Robert H.: *See*—
Anderson, Forest L.; and Nation, Robert H., 4,351,155, Cl. 60-618.000.
National Institute of Radiological Sciences: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.
National Machinery Company, The: *See*—
Allebach, Gene E., 4,351,180, Cl. 72-405.000.
National Research Development Corporation: *See*—
Blair, Albert; and Grant, Patrick T., 4,351,268, Cl. 119-3.000.
Gray, John O.; and Sanderson, Michael L., 4,351,189, Cl. 73-196.000.
Natsuaki, Nobuyoshi: *See*—
Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, 4,351,674, Cl. 148-1.500.
NCR Corporation: *See*—
Allbright, Forrest E., 4,351,988, Cl. 200-5.00A.
O'Connell, Stephen B., 4,352,100, Cl. 340-723.000.
Voyer, Joseph L., 4,352,153, Cl. 363-56.000.
Neal, Barry; and Morris, Timothy M., to Mach-Neal, Inc. Insert apparatus. 4,351,517, Cl. 270-52.000.
Neal, James V., Jr.: *See*—
Fajt, John; and Neal, James V., Jr., 4,351,578, Cl. 316-1.000.
Negro, Guido: *See*—
Mann, Friedrich; and Negro, Guido, 4,351,371, Cl. 140-92.300.
Neidleman, Saul L.; Amon, William F., Jr.; and Geigert, John, to Cetus Corporation. Production of 2-keto-D-gluconic acid and hydrogen peroxide. 4,351,902, Cl. 435-137.000.
Nelson, Gale C.: *See*—
Bardens, William H.; and Nelson, Gale C., 4,352,119, Cl. 357-78.000.
Nelson, James A.: *See*—
Lazarus, Harrison; and Nelson, James A., 4,351,333, Cl. 128-214.400.
Nemo Industries, Inc.: *See*—
Elsas, Norman E., 4,351,073, Cl. 4-654.000.
Neriki, Yoshiaki: *See*—
Ojima, Shin; and Neriki, Yoshiaki, 4,351,318, Cl. 126-208.000.
Neuman, Richard F.: *See*—
Garrett, Wayne; and Neuman, Richard F., 4,351,419, Cl. 188-71.900.
Neville, William A.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; Rozzo, Nancy A.; and Bourne, Richard G., 4,351,735, Cl. 252-1.000.
Newman, Bruce A.; and Boyer, Lyndon D., to Conoco Inc. Processing of heavy high-sulfur feedstocks. 4,351,702, Cl. 201-5.000.
Newman, Don, to Stretch Devices, Inc. Method of making railing. 4,351,469, Cl. 228-135.000.
Newns, George R.: *See*—
Beales, Keith J.; Day, Clive R.; and Newns, George R., 4,351,659, Cl. 65-3.130.
Nezworski, James E., to Perlick Company, Inc., The. Valved keg closure. 4,351,456, Cl. 222-400.700.
Nicholson, Graham, to British Nuclear Fuels Limited. Grids for nuclear fuel assemblies. 4,351,795, Cl. 376-442.000.
Nicholson, Ross C.: *See*—
Ingersoll, Brian E.; Nicholson, Ross C.; and Dennisson, James W., 4,351,448, Cl. 220-318.000.
Nielsen, Hilmar R. Impregnating composition, a process for its preparation and products prepared by using the composition. 4,351,669, Cl. 106-2.000.
Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki, 4,351,195, Cl. 74-10.330.
Niida, Taro: *See*—
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.
Nims, Philip A.: *See*—
Guy, David A.; and Nims, Philip A., 4,351,370, Cl. 139-450.000.
Nippon Electric Co.: *See*—
Yamasaki, Koji, 4,352,091, Cl. 340-311.100.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kumano, Shinji, 4,351,222, Cl. 84-423.00R.
Okamoto, Shimaji; and Nagai, Yohei, 4,351,212, Cl. 84-1.010.
Suzuki, Hideo; and Kaneko, Makoto, 4,351,214, Cl. 84-1.030.
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,351,220, Cl. 84-1.240.
Nippon Kogaku K. K.: *See*—
Hasegawa, Hiroshi; and Maida, Osamu, 4,351,600, Cl. 354-60.00L.
Nippon Seiko Kabushiki Kaisha: *See*—
Miyahara, Takashi, 4,351,427, Cl. 192-98.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kimura, Takao; Sakaguchi, Shigeki; and Takata, Hisao, 4,351,657, Cl. 65-3.110.
Nippon Zeon Co. Ltd.: *See*—
Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, 4,351,747, Cl. 252-511.000.
Nippondenso Co., Ltd.: *See*—
Isogai, Kiyoshi; and Sugaya, Kazuyoshi, 4,351,305, Cl. 123-590.000.
Shirasaki, Shinji; Yamada, Takashi; and Shimamoto, Mamoru, 4,351,287, Cl. 123-609.000.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; and Yamada, Takashi, 4,351,282, Cl. 123-425.000.
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, to Kawasaki Steel Corporation. Oil film bearing for rolling roll. 4,351,576, Cl. 308-37.000.
Nishimura, Akimasa: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, 4,351,590, Cl. 352-140.000.
Nishimura, Tadahiko; Yamamoto, Hiroshi; Osuo, Masatoshi; and Kanazawa, Akio, to Mitsui Petrochemical Industries, Ltd. Process for producing phenolic compounds. 4,351,967, Cl. 568-754.000.
Nishizawa, Akira: *See*—
Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, 4,351,747, Cl. 252-511.000.
Nissan Motor Company, Limited: *See*—
Hashimoto, Akihiro, 4,351,555, Cl. 296-37.160.
Masaki, Kenji; and Saito, Masaaki, 4,351,480, Cl. 239-585.000.
Nomura, Hiroyuki; Kawasaki, Teruo; and Takeuchi, Mikio, 4,352,062, Cl. 324-169.000.
Tsunoda, Masakazu, 4,352,088, Cl. 340-52.00F.
Tuchiya, Yoshimasa; Ishii, Katsumi; Iidaka, Toshiharu; and Fujita, Masao, 4,351,561, Cl. 296-216.000.
Yano, Hiroshi; and Tsunoda, Masakazu, 4,352,089, Cl. 340-52.00F.
Nixdorf Computer AG: *See*—
Hager, Horst, 4,352,133, Cl. 360-106.000.
Hullwegen, Josef, 4,352,190, Cl. 375-14.000.
Unglaube, Uwe; and Miehe, Friedrich V., 4,352,096, Cl. 340-815.060.
Nixdorff Krein Industries, Inc.: *See*—
Mead, Harold C., 4,351,535, Cl. 280-5.00R.
Noguchi, Hidetami: *See*—
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, 4,351,576, Cl. 308-37.000.
Noguchi, Masahiro: *See*—
Nyuji, Tomoaki; Kawasaki, Itaru; Noguchi, Masahiro; and Tsukamoto, Masahide, 4,352,162, Cl. 364-724.000.
Nohara, Norimasa: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.
Noiles, Douglas G., to United States Surgical Corporation. Disposable instrument for surgical fastening. 4,351,466, Cl. 227-8.000.
Nomura, Hiroyuki; Kawasaki, Teruo; and Takeuchi, Mikio, to Nissan Motor Co., Ltd. Digital display type tachometer for an automobile. 4,352,062, Cl. 324-169.000.
Nomura, Toshio: *See*—
Date, Tasuku; Nomura, Toshio; and Kobayashi, Isao, 4,352,158, Cl. 364-431.050.
Nordischer Maschinenbau Rud. Baader: *See*—
Jahnke, Joachim; Lehming, Gunther; Kunig, Helmut; and Nagel, Jens, 4,351,089, Cl. 19-129.00R.

Nordson Corporation: *See*—
Baker, Robert G.; and Ramazzotti, Dario J., 4,352,007, Cl. 219-301.000.
Norman, Ralph L.: *See*—
Hagood, Jerry W.; and Norman, Ralph L., 4,352,039, Cl. 310-328.000.
Northern Telecom, Inc.: *See*—
Young, Robert E.; and Huffman, Richard K., 4,351,984, Cl. 179-7.10R.
Northwood Mills Ltd.: *See*—
Jasperson, F. Bon, 4,351,912, Cl. 523-218.000.
Norton, John: *See*—
Swadling, Sidney J.; Mansbridge, Martin H.; Payne, Dennis J.; and Norton, John, 4,351,470, Cl. 228-157.000.
Novoselov, Nikolai M.: *See*—
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.
Nuovo Pignone S.p.A.: *See*—
Filidoro, Roberto; and Di Sciascio, Nicola, 4,351,353, Cl. 137-219.000.
Nyuji, Tomoaki; Kawasaki, Itaru; Noguchi, Masahiro; and Tsukamoto, Masahide, to Matsushita Electric Industrial Co., Ltd. Digital filter. 4,352,162, Cl. 364-724.000.
OBE-Werk Ohnmacht & Baumgartner GmbH & Co. K.G.: *See*—
Drlik, Gunther, 4,351,086, Cl. 16-228.000.
Occidental Research Corporation: *See*—
Megy, Joseph A.; and Hard, Robert A., 4,351,809, Cl. 423-167.000.
Megy, Joseph A.; and Hard, Robert A., 4,351,813, Cl. 423-304.000.
Ochiai, Izumi: *See*—
Uehara, Katuharu; and Ochiai, Izumi, 4,351,178, Cl. 72-383.000.
O'Connell, Stephen B., to NCR Corporation. Image formatting apparatus for visual display. 4,352,100, Cl. 340-723.000.
Oelbermann, Max: *See*—
Rademacher, Karl A.; and Oelbermann, Max, 4,351,725, Cl. 210-230.000.
Oesterlin, Rudolf, to Sterling Drug Inc. Improved process for preparing 3-(4-pyridinyl)aniline. 4,351,944, Cl. 546-329.000.
Offshore Company, The: *See*—
Ray, Donald R.; and Steddum, Riddle E., 4,351,258, Cl. 114-230.000.
Ogata, Masaru; and Matsumoto, Hiroshi, to Shionogi & Co., Ltd. Preparation of N(2-pyrrolidinylmethyl)2-methoxy-5-benzenesulfonamidobenzamides. 4,351,770, Cl. 548-567.000.
Ogle, Francis H., Jr., to Transamerica DeLaval Inc. Check-valve construction. 4,351,358, Cl. 137-512.100.
Oguchi, Takuro; Ohsawa, Zenichi; and Murai, Shinichi, to Fujitsu Limited. Temperature compensating voltage generator circuit. 4,352,053, Cl. 323-220.000.
Ohai, Reynolds K. Loop for leveling a hanging lamp. 4,351,506, Cl. 248-344.000.
Ohama, Satoru. Detection and alarm device for use with car for detecting obstacle and abnormal conditions of tire. 4,352,090, Cl. 340-52.00R.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Pushbutton tuner. 4,351,195, Cl. 74-10.330.
Ohgishi, Tsutomu; and Sakurai, Tadashi, to Sanyo Electric Co., Ltd. Entry apparatus of digital value in memory. 4,352,204, Cl. 455-182.000.
Ohkubo, Wataru, to Alps Electric Company, Ltd. Station selecting device. 4,352,203, Cl. 455-176.000.
Ohkura, Makoto: *See*—
Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, 4,351,674, Cl. 148-1.500.
Ohniwa, Takehiko; and Saito, Syuichiro, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Electromagnetic driving source for shutter. 4,351,596, Cl. 354-234.000.
Ohnmacht, Helmut: *See*—
Hofer, Edwin; and Ohnmacht, Helmut, 4,352,008, Cl. 219-540.000.
Ohori, Tamio; Mastumoto, Fuyuhiko; and Tomita, Satoru, to Ricoh Company, Ltd. Combination electrostatic copying machine and facsimile transceiver. 4,352,128, Cl. 358-294.000.
Ohsawa, Zenichi: *See*—
Oguchi, Takuro; Ohsawa, Zenichi; and Murai, Shinichi, 4,352,053, Cl. 323-220.000.
Ohta, Junpei: *See*—
Mitsui, Tadashi; Wasaki, Masaru; and Ohta, Junpei, 4,352,080, Cl. 336-83.000.
Ohtake, Yasushi: *See*—
Hasegawa, Tsunao; and Ohtake, Yasushi, 4,352,130, Cl. 360-66.000.
Ohwaki, Shinji: *See*—
Takahashi, Masao; Yoshida, Katumi; Ohwaki, Shinji; and Moriga, Hiroyuki, 4,351,738, Cl. 252-8.750.
Ojima, Shin; and Neriki, Yoshiaki, to Hosiden Electronics Co., Ltd. Pocket body warmer with a cigarette lighter. 4,351,318, Cl. 126-208.000.
Oka, Yoshitami: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,351,894, Cl. 430-313.000.
Okada, Akira: *See*—
Miyata, Shigeo; and Okada, Akira, 4,351,814, Cl. 423-306.000.
Okada, Takashi; Sahara, Hiroshi; and Otsuka, Fumikazu, to Sony Corporation. Constant current source. 4,352,057, Cl. 323-315.000.
Okajima, Hidekazu: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, 4,351,590, Cl. 352-140.000.
Okamoto, Katuhiko: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,351,765, Cl. 260-163.000.
Okamoto, Shimaji; and Nagai, Yohei, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with equally spaced binary note codes. 4,351,212, Cl. 84-1.010.
Okamura, Shigeru: *See*—
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.
Okouchi, Isao: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.
Okuda, Takao: *See*—
Miyamoto, Kazumichi; Nishizawa, Akira; Okuda, Takao; Nakamura, Mamoru; and Abe, Takaharu, 4,351,747, Cl. 252-511.000.
Old National Bank in Evansville, administrator: *See*—
Simms, Jack C., deceased; and Old National Bank in Evansville, administrator, 4,351,939, Cl. 544-230.000.
Oldershaw, C. G. Peter, to General Foods Corporation. Pouch filling machine. 4,351,374, Cl. 141-71.000.
Olshansky, Robert, to Corning Glass Works. Manufacture of optical fibers. 4,351,658, Cl. 65-3.120.
Olson, Glenn O., to Boeing Company, The. Composite aircraft structure having lightning protection. 4,352,142, Cl. 361-218.000.
Olson, John S., to Phillips Petroleum Company. Hydrocarbon heating apparatus. 4,351,803, Cl. 422-106.000.
Olympus Optical Co. Ltd.: *See*—
Hosoda, Seiichi, 4,352,150, Cl. 362-282.000.
Matsuo, Kazumasa; and Kubota, Tetsumaru, 4,351,587, Cl. 350-255.000.
ONEAC Corporation: *See*—
McCartney, Thomas, 4,352,055, Cl. 323-263.000.
Ono Pharmaceutical Co., Ltd.: *See*—
Matsumoto, Kimiichiro; Miyake, Hajimu; and Suga, Hisashi, 4,351,846, Cl. 424-305.000.
Ontrax Corporation: *See*—
Schulze, Dieter M. O. T., 4,352,048, Cl. 318-135.000.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,351,941, Cl. 546-258.000.
Opie, William R.: *See*—
Ernst, Runyon G., deceased; Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., 4,351,705, Cl. 204-108.000.
Opper, Ray C. Adaptor for charging small cells in large-cell charger. 4,352,052, Cl. 320-2.000.
Optical Coating Laboratory, Inc.: *See*—
Kamerling, Marc A., 4,351,681, Cl. 156-99.000.
Orion-yhtyma Oy: *See*—
Sothmann, Gunnar A.; and Marttila, Esko V., 4,351,825, Cl. 424-19.000.
Orme, Myrl E., to Bendix Corporation, The. Fail safe compensator used in a hydraulic servo control system. 4,351,357, Cl. 137-446.000.
Ortner, Artur; and Zeller, Rudolf, to Voest-Alpine Aktiengesellschaft. Method of recovering the sensible heat of continuously cast slabs. 4,351,633, Cl. 432-77.000.
Osaka Prefectural Government: *See*—
Hatano, Yasuhiro; and Nakao, Kazumune, 4,351,978, Cl. 585-469.000.
Osaka, Susumu: *See*—
Toda, Minoru; and Osaka, Susumu, 4,351,192, Cl. 73-861.180.
Osborn, Thomas W., III, to Procter & Gamble Company, The. Soft, absorbent tissue paper. 4,351,699, Cl. 162-112.000.
Osborne, John R., to Memorex Corporation. Variable sloped etching of thin film heads. 4,351,698, Cl. 156-661.100.
Osuo, Masatoshi: *See*—
Nishimura, Tadahiko; Yamamoto, Hiroshi; Osuo, Masatoshi; and Kanazawa, Akio, 4,351,967, Cl. 568-754.000.
Otani, Takashi, t. Toyoda Gosei Co., Ltd. Molding. 4,351,868, Cl. 428-120.000.
Otawa, Shuji: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,352,172, Cl. 368-76.000.
Otsuji, Hiroyuki: *See*—
Shindome, Mamoru; Yanagita, Takanori; Nakamura, Takanori; and Otsuji, Hiroyuki, 4,351,252, Cl. 110-346.000.
Otsuka, Fumikazu: *See*—
Okada, Takashi; Sahara, Hiroshi; and Otsuka, Fumikazu, 4,352,057, Cl. 323-315.000.
Ott, Lothar: *See*—
Gessner, Dieter; and Ott, Lothar, 4,351,631, Cl. 425-533.000.
Ottone, Robert J., to DC Electronic Industries, Inc. Battery analyzer. 4,352,067, Cl. 324-434.000.
Ouchi, Teruo; and Ueda, Hirohisa, to Kabushiki Kaisha Medos Kenkyusho. Curvable pipe assembly in endoscope. 4,351,323, Cl. 128-4.000.
Ouellette, Alfred R., to Itek Corporation. Transport system for phototypesetting machine. 4,351,460, Cl. 226-25.000.
Ouellette, Joseph F., to Ouellette Machinery Systems. Apparatus and method for automatically filling and heat weld sealing lengths of plastic tubing. 4,351,692, Cl. 156-443.000.

Ouellette Machinery Systems: *See—*
Ouellette, Joseph F., 4,351,692, Cl. 156-443.000.
Ousby, John C.: *See—*
Bailey, Martin; Hines, David A.; Ousby, John C.; and Roesler, Frank C., 4,351,730, Cl. 210-629.000.
Outboard Marine Corporation: *See—*
Wick, Gerald H., 4,351,279, Cl. 123-391.000.
Outokumpu Oy: *See—*
Kosonen, Aini A., 4,351,326, Cl. 128-130.000.
Owatonna Tool Company: *See—*
Solie, James C.; and McClocklin, Samuel B., 4,351,362, Cl. 137-625.650.
Owen, Donald W. Multi-phase current balancing compensator. 4,352,026, Cl. 307-14.000.
Owen, Oliver E. Semi-quantitative assay of metabolic acids. 4,351,899, Cl. 435-26.000.
Owens, William R.; Chan, Henry C.; Abraham, Ooriapadical C.; and Parker, Levi C., to Texaco Inc. Control system for gas dehydrators. 4,351,649, Cl. 55-162.000.
Oxenreider, Terry, to General Battery Corporation. Battery case having a side terminal molded therein. 4,351,890, Cl. 429-179.000.
Oxman, Martin H., to Bell and Howell Company. Wireless aircraft passenger audio entertainment system. 4,352,200, Cl. 455-41.000.
Oxysynthese: *See—*
Thirion, Pierre, 4,351,820, Cl. 423-588.000.
Oy Wartsila AB: *See—*
Martikainen, Kaarlo, 4,351,172, Cl. 70-366.000.
Oy Wartsila AB: *See—*
Johansson, Bengt; Keinonen, Arno; and Makinen, Eero, 4,351,255, Cl. 114-41.000.
Paananen, Eugene E.: *See—*
Fasig, Harold A.; and Paananen, Eugene E., 4,352,013, Cl. 250-223.00R.
Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,351,941, Cl. 546-258.000.
Pajot, Michel: *See—*
Boudot, Bernard; Grosbois, Jean; and Pajot, Michel, 4,351,821, Cl. 423-624.000.
Palau, Joseph, to S.A. des Etablissements Staubli. Dobby. 4,351,368, Cl. 139-324.000.
Palmer, Michael C. Means for removing residual water from a surface. 4,351,723, Cl. 210-198.100.
Pandzik, Richard T.: *See—*
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,351,227, Cl. 92-71.000.
Panetz, Allen I.: *See—*
Kopp, Reiner H.; and Panetz, Allen I., 4,351,800, Cl. 422-70.000.
Pannier, Steven R. Livestock feeder with adjustable feed gate. 4,351,274, Cl. 119-53.500.
Pares Olivet, Eulalia: *See—*
LLorente Agudo, Nieves; Elia Miguel, Maria F.; Aranguren Escobar, Maria A.; Pares Olivet, Eulalia; and Fernandez Garvajosa, Jose M., 4,351,903, Cl. 435-234.000.
Parish, Darrell J.; and Mallouk, Robert S., to Du Pont de Nemours, E. I., and Company. Compound dispersions and films. 4,351,746, Cl. 252-511.000.
Parker, Charles R.: *See—*
Tigner, Thomas E.; and Parker, Charles R., 4,352,046, Cl. 315-362.000.
Parker-Hannifin Corporation: *See—*
Cyrot, Luc P., 4,351,226, Cl. 91-387.000.
Parker, Jack: *See—*
Holland, Eddie L.; Stallings, Charles K.; and Parker, Jack, 4,351,273, Cl. 119-51.00R.
Parker, Levi C.: *See—*
Owens, William R.; Chan, Henry C.; Abraham, Ooriapadical C.; and Parker, Levi C., 4,351,649, Cl. 55-162.000.
Parker, Peter D.: *See—*
Ernst, Runyon G., deceased; Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., 4,351,705, Cl. 204-108.000.
Parmeko Limited: *See—*
Stephen, James H.; McCann, John D.; and Flemming, Michael A., 4,352,098, Cl. 340-572.000.
Parrillo, Michael R.; and Colwell, John C., to Bunker Ramo Corporation. ECG Patient monitoring lead assembly. 4,351,343, Cl. 128-695.000.
Patchett, Arthur A.; and Kuo, Chan-Hwa, to Merck & Co., Inc. Hypocholesterolemic hydrogenation products and process of preparation. 4,351,844, Cl. 424-279.000.
Patel, Naren I., to Siecor Corporation. Filling materials for electrical and light waveguide communications cables. 4,351,913, Cl. 523-218.000.
Patnaik, Birendra K., to El Paso Polyolefins Company. Propylene copolymerization process and product. 4,351,930, Cl. 526-125.000.
Paul Mueller Company: *See—*
Mueller, Paul; Manna, Daniel C.; and Prine, Ray A., 4,351,271, Cl. 119-14.090.
Payne, Dennis J.: *See—*
Swadling, Sidney J.; Mansbridge, Martin H.; Payne, Dennis J.; and Norton, John, 4,351,470, Cl. 228-157.000.
Payne, Roger E.: *See—*
Pilliod, Charles J., Jr.; and Payne, Roger E., 4,351,380, Cl. 152-169.000.
Pearsall, Wally. Dual purpose jacket. 4,351,066, Cl. 2-85.000.
Peash, Douglas E.; and Yorozu, Arthur S., to Boeing Company, The. Ram air enhanced relief valve. 4,351,501, Cl. 244-129.100.
Peeples, Marion E.: *See—*
Calhoun, Leslie D.; and Peeples, Marion E., 4,351,388, Cl. 165-104.260.
Pelerin, Jacques, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method of protecting devices for galvanizing metal products. 4,351,854, Cl. 427-34.000.
Pelerin, Jacques: *See—*
Cosse, Paul; and Pelerin, Jacques, 4,351,862, Cl. 427-300.000.
Penney, Gaylord W., to United Air Specialists, Inc. Electrostatic precipitator having dual polarity ionizing cell. 4,351,648, Cl. 55-137.000.
Pennwalt Corporation: *See—*
Griffith, Ronald C.; and Kinsolving, Clyde R., 4,351,847, Cl. 424-325.000.
Toukan, Sameeh S.; and Hauptschein, Murray, 4,351,946, Cl. 548-142.000.
Perez, Andre; Boljevic, Jean M.; and Dautremay, Alain, to Thomson-CSF. Timing signal synchronization device. 4,352,192, Cl. 375-56.000.
Perlick Company, Inc., The: *See—*
Nezworski, James E., 4,351,456, Cl. 222-400.700.
Perreault, Irenee: *See—*
Chartrand, Joseph A.; and Perreault, Irenee, 4,351,250, Cl. 110-227.000.
Perron, Robert: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,351,953, Cl. 562-519.000.
Perrot, Erwin, to Klauschenz & Perrot KG. Process for dialyzation of blood. 4,351,731, Cl. 210-647.000.
Petersen, Richard W.: *See—*
Kirkman, Michael; Rydwansky, Frank C., Jr.; Hanlon, Richard J.; and Petersen, Richard W., 4,351,580, Cl. 339-17.0CF.
Peterson, Carlton F.: *See—*
Sivertsen, John W., 4,351,128, Cl. 43-44.910.
Peterson, Roger W.: *See—*
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Petrolite Corporation: *See—*
Winslow, Joseph D., Jr., 4,351,703, Cl. 204-1.00T.
Pettit, Geroge D.: *See—*
Chappell, Terry I.; Pettit, Geroge D.; and Woodall, Jerry M., 4,351,706, Cl. 204-129.300.
Pezet, Michael J.: *See—*
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda, 4,351,485, Cl. 241-36.000.
Pfaff, Georg: *See—*
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.
Pfeiffer, Josef: *See—*
Steinberger, Helmut; Moretto, Hans-Heinrich; Kortmann, Wilfried; and Pfeiffer, Josef, 4,351,736, Cl. 252-8.600.
Pfizer Inc.: *See—*
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,351,940, Cl. 544-293.000.
Holland, Gerald F., 4,351,843, Cl. 424-274.000.
Johnson, Michael R., 4,351,833, Cl. 424-248.500.
Pirie, Donald K., 4,351,840, Cl. 424-271.000.
Shively, Jesse E., 4,351,845, Cl. 424-283.000.
Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,351,639, Cl. 8-94.160.
PFP-Anstalt Fur Produktentwicklung und Verwertung: *See—*
Schramm, Werner, 4,351,441, Cl. 211-207.000.
Pfundner, Hans P.: *See—*
Droscher, Erich; Pfundner, Hans P.; and Wrulich, Herwig, 4,351,564, Cl. 299-1.000.
Phares, Gary L. Pulled bow arrow holder. 4,351,311, Cl. 124-41.00A.
Phillips, Michael J.; and Crick, Aubrey M., to International Standard Electric Corporation. Termination of optical fibers. 4,351,586, Cl. 350-96.200.
Phillips Petroleum Company: *See—*
Eddy, William R., 4,351,472, Cl. 229-43.000.
Likins, Merle R., Jr.; and Stacy, Galen D., 4,351,818, Cl. 423-450.000.
Olson, John S., 4,351,803, Cl. 422-106.000.
Ray, Gardner C.; and Solomon, Paul W., 4,351,963, Cl. 568-477.000.
Reusser, Robert E.; Claytor, Elizabeth A.; and Jones, Brenton E., 4,351,980, Cl. 585-820.000.
Slagel, John E.; and Howard, Allen C., 4,351,817, Cl. 423-450.000.
Pilliod, Charles J., Jr.; and Payne, Roger E., to Goodyear Tire & Rubber Company, The. Track belt assembly. 4,351,380, Cl. 152-169.000.
Pinkhasov, Eduard. Noncrucible method of and apparatus for the vapor deposition of material upon a substrate using voltaic arc in vacuum. 4,351,855, Cl. 427-37.000.
Pioneer Electronic Corporation: *See—*
Hasegawa, Tsunao; and Ohtake, Yasushi, 4,352,130, Cl. 360-66.000.
Yamamuro, Isao; and Tsukagoshi, Tsunehiro, 4,351,412, Cl. 181-170.000.
Pirie, Donald K., to Pfizer Inc. Antibacterial esters of resorcinol with ampicillin and penicillanic acid 1,1-dioxide derivatives. 4,351,840, Cl. 424-271.000.
Pittard, Hal K., Jr. Combination oil plug wrench and integral oil filler. 4,351,075, Cl. 7-138.000.

Plantard, Dominique; Langlais, Gerard; and Fournier, Rene, to Isover Saint-Gobain. Toration with multiple jet deflection. 4,351,660, Cl. 65-5.000.

Plantard, Dominique: *See*—
Levecque, Marcel, deceased; Levecque, Marc, administrator; Battigelli, Jean A.; and Plantard, Dominique, 4,351,661, Cl. 65-5.000.

Plymale, Jay F. Restraining device. 4,351,169, Cl. 70-16.000.

Poddar, Syamal K.: *See*—
Gorbaty, Martin L.; Stone, John B.; and Poddar, Syamal K., 4,351,716, Cl. 208-8.0LE.

Polaroid Corporation: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,351,593, Cl. 354-27.000.

Poling, Ronald W., to General Electric Company. Method of making a control device. 4,351,105, Cl. 29-622.000.

Politechnika Gdanska: *See*—
Stefanska, Barbara J.; Falkowski, Leonard S.; and Borowski, Edward, 4,351,937, Cl. 536-6.400.

Pollard, David E., to Helgeson Nuclear Services, Inc. In-vivo radiation counter. 4,352,019, Cl. 250-394.000.

Polson, Charles L., to Dover Corporation. Dual spout dispensing nozzle. 4,351,375, Cl. 141-98.000.

Pomeco Corporation: *See*—
Madden, Michael J., 4,351,446, Cl. 220-210.000.

Poncin, Jacques; Rogel, Pierre; and Remy, Maurice. System for reducing visible noise in television images. 4,352,126, Cl. 358-167.000.

Popper, Paul: *See*—
Martinengo, PierCarlo; Giachello, Angelo; Tommasini, Giuseppe; and Popper, Paul, 4,351,787, Cl. 264-65.000.

Possati, Mario, to Finike Italiana Marposs, S.p.A. Apparatus for checking the linear dimensions of shafts. 4,351,115, Cl. 33-178.00D.

Post Office, The: *See*—
Beales, Keith J.; Day, Clive R.; and Newns, George R., 4,351,659, Cl. 65-3.130.

Pound, William C.: *See*—
Valbona, Bruno M.; and Pound, William C., 4,351,612, Cl. 366-206.000.

Powell, Brian. Sampler and cell for radon detectors and method of using same. 4,352,014, Cl. 250-253.000.

Power, Joseph S.: *See*—
Schultz, Edward R., Jr.; Cook, Kenneth J.; Power, Joseph S.; and Ruszala, Frederick B., 4,352,163, Cl. 364-801.000.

Powers, John W.: *See*—
Marcantonio, Arnold F.; Kress, Paul J.; and Powers, John W., 4,351,883, Cl. 428-450.000.

PPG Industries, Inc.: *See*—
Das, Balbhadra; and Fahey, Dennis M., 4,351,752, Cl. 523-401.000.
Henery, Vern A., 4,351,861, Cl. 427-255.100.
Jensen, Thomas H., 4,351,656, Cl. 65-1.000.

PR Processutveckling AB: *See*—
Molin, Roland, 4,351,132, Cl. 51-180.000.

Prager, Elliot D. Stoma control device and method. 4,351,322, Cl. 128-1.00R.

Pratt, Barbara J.: *See*—
Brickner, Laurence R.; Moutner, David N.; and Pratt, Barbara J., 4,351,230, Cl. 98-31.000.

Prem, Dorothy C.; Duke, June T.; and Isley, Ralph E., to SOHIO. Rubber-modified high nitrile copolymers with improved impact resistance. 4,351,756, Cl. 524-314.000.

Prewarski, Mike, to International Business Machines Corporation. Selection controlled print impression control for single element impact printers. 4,351,618, Cl. 400-166.000.

Prince, George T.; and Ballendux, Gerardus M., to Allis-Chalmers Corporation. Torsion vibration damper. 4,351,168, Cl. 464-64.000.

Prine, Ray A.: *See*—
Mueller, Paul; Manna, Daniel C.; and Prine, Ray A., 4,351,271, Cl. 119-14.090.

Prins, Klaar; and Prins, Reinout K. N. J. Well drilling apparatus. 4,351,398, Cl. 173-104.000.

Prins, Reinout K. N. J.: *See*—
Prins, Klaar; and Prins, Reinout K. N. J., 4,351,398, Cl. 173-104.000.

Procter & Gamble Company, The: *See*—
Osborn, Thomas W., III, 4,351,699, Cl. 162-112.000.

Professional Marketing Associates: *See*—
Cobleigh, Wendall C.; and Barmore, Donald L., 4,351,208, Cl. 83-167.000.

Propst, Robert L.; and Raftery, William B., to Herman Miller, Inc. Vehicle towing system. 4,351,541, Cl. 280-408.000.

Psaras, John D.; and Zahniser, James A., to C. M. Kemp Manufacturing Co., The. Dehydration of ethanol. 4,351,732, Cl. 210-689.000.

Puckette, Charles M., to General Electric Company. Linear mixer with reduced spurious responses. 4,352,210, Cl. 455-317.000.

Purcell, Dennis W.: *See*—
Jones, Peter W. J.; and Purcell, Dennis W., 4,352,063, Cl. 324-171.000.

Puschner, Kurt: *See*—
Kriebitzsch, Norbert; Puschner, Kurt; and Hentschel, Klaus, 4,351,644, Cl. 23-293.00R.

Quadra Wheelchairs, Inc.: *See*—
Minnebraker, Jeffrey P., 4,351,540, Cl. 280-242.0WC.

Queneau, Paul B.: *See*—
Beckstead, Leo W.; Huggins, Dale K.; and Queneau, Paul B., 4,351,808, Cl. 423-61.000.

Quinn, James R.: *See*—
Boyd, Douglas P.; Herrmannsfeldt, William B.; Quinn, James R.; and Sparks, Robert A., 4,352,021, Cl. 378-12.000.

R.F. Technical Products, Inc.: *See*—
Cross, James A.; and Snyder, John E., 4,352,207, Cl. 455-223.000.

R.G.B. Laboratories Inc.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; Rozzo, Nancy A.; and Bourne, Richard G., 4,351,735, Cl. 252-1.000.

R. L. Drake Company: *See*—
Koogler, Steven C., 4,352,010, Cl. 235-92.0EV.

Racal-Milgo, Inc.: *See*—
Miller, William J.; and Trbovich, Nick G., 4,351,982, Cl. 178-22.110.

Rademacher, Karl A.; and Oelbermann, Max, to Rittershaus & Blecher GmbH. Plate filter press with stop rails for plate guidance. 4,351,725, Cl. 210-230.000.

Radiation Dynamics, Inc.: *See*—
Harney, Robert C., 4,352,105, Cl. 343-5.0CD.

Radigan, Kenneth J., to Fairchild Camera & Instrument Corp. Corrosion inhibition of aluminum or aluminum alloy film utilizing bromine-containing plasma. 4,351,696, Cl. 156-643.000.

Radio Research Laboratories, Ministry of Posts and Telecommunications: *See*—
Fukushima, Madoka; Akita, Kin-ichiro; and Masuda, Yoshihisa, 4,351,188, Cl. 73-189.000.

Radisic, Branko: *See*—
Halilovic, Esref; and Radisic, Branko, 4,351,308, Cl. 123-627.000.

Raff, Dieter: *See*—
Schleupen, Richard; Kaufmann, Reinhold; and Raff, Dieter, 4,351,309, Cl. 123-630.000.

Raftery, William B.: *See*—
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Rajagopalan, Parthasarathi, to Du Pont de Nemours, E. I., and Company. 1,2,3,4,4a,5,10,10a-Octahydro-5,10-ortho-benzenobenz[-g]isoquinolines and antidepressant use thereof. 4,351,836, Cl. 424-258.000.

Rajcevic, Harold P.: *See*—
Ernst, Runyon G., deceased; Ernst, Margaret, executrix; Opie, William R.; Rajcevic, Harold P.; and Parker, Peter D., 4,351,705, Cl. 204-108.000.

Rakhit, Sumanas; and Bagli, Jehan F., to American Home Products Corporation. 2-(Piperazinyl)-4-pyrimidinamines. 4,351,832, Cl. 424-246.000.

Raley, Garland E.: *See*—
Thomas, Paul E.; and Raley, Garland E., 4,351,784, Cl. 264-22.000.

Ramanadin, R.; Roustan, Alain; and Soula, Gerard, to Rhone-Poulenc Industries. Preparation of fluorobenzonitriles. 4,351,777, Cl. 260-465.00G.

Ramazzotti, Dario J.: *See*—
Baker, Robert G.; and Ramazzotti, Dario J., 4,352,007, Cl. 219-301.000.

Ramsey, James M.: *See*—
Emerson, James A.; Ramsey, James M.; and Buck, Kerry O., 4,351,582, Cl. 339-97.00R.

Ramsey, Robert E.: *See*—
Clements, Gary B.; and Ramsey, Robert E., 4,351,090, Cl. 24-263.00D.

Rarig, Larry L.; Alleman, Raymond A.; and Miller, Dennis L., to RCA Corporation. Apparatus for sensing bare metal on a moving strip of insulatively coated conductive material. 4,351,263, Cl. 118-665.000.

Rattee, Ian D.: *See*—
Lewis, Edward J.; and Rattee, Ian D., 4,351,871, Cl. 428-195.000.

Ray, Donald R.; and Steddum, Riddle E., to Offshore Company, The. Method and apparatus for tension mooring a floating platform. 4,351,258, Cl. 114-230.000.

Ray, Gardner C.; and Solomon, Paul W., to Phillips Petroleum Company. Aliphatic olefin oxidation using catalyst containing Sn, P, O, Li. 4,351,963, Cl. 568-477.000.

Raychem Corporation: *See*—
Middleman, Lee M.; Evans, Joseph H.; Blake, Arthur E.; and Scheff, Victor A., 4,352,083, Cl. 338-23.000.

Raymond International Builders, Inc.: *See*—
Fuller, Francis M., 4,351,136, Cl. 52-155.000.
Heinz, Edward J.; and Collins, H. Thomas, 4,351,623, Cl. 405-210.000.

RCA Corporation: *See*—
Aschwanden, Felix, 4,352,206, Cl. 455-184.000.
Caracappa, Michael G., 4,352,194, Cl. 375-89.000.
Carlson, David J.; and Tsou, Sander H. C., 4,352,111, Cl. 343-860.000.
Crooks, Horatio N., 4,352,175, Cl. 369-77.000.
Duffy, Michael T.; and Zanzucchi, Peter J., 4,352,016, Cl. 250-358.100.
Duffy, Michael T.; Corboy, John F., Jr.; and Zanzucchi, Peter J., 4,352,017, Cl. 250-358.100.
Hertzler, Merle E., 4,351,265, Cl. 118-211.000.
Holbrook, Mark D.; and Knapp, William K., 4,352,031, Cl. 307-444.000.
Rarig, Larry L.; Alleman, Raymond A.; and Miller, Dennis L., 4,351,263, Cl. 118-665.000.
Reitmeier, Glenn A.; and Dischert, Robert A., 4,352,122, Cl. 358-11.000.
Toda, Minoru; and Osaka, Susumu, 4,351,192, Cl. 73-861.180.

Reed, Alan C.; and Sherwood, John H., to Utility Devices, Inc. Data recording method and apparatus. 4,352,164, Cl. 364-900.000.

Reesink, Johan B.; Hageman, Hendrik J.; and Wiersum, Ulfert E., to Akzo N.V. Thermosetting coating composition containing a blocked acid catalyst. 4,351,935, Cl. 528-242.000.

Rehme, Wilfried; Stipura, Anatoly; Ripnyi, Victor; Donskoi, Leonid; and Schevtschenko, Nikolai. Ultrasonic non-destructive testing device for welding beads. 4,351,190, Cl. 73-638.000.

Reiber, Hans, to International Standard Electric Corporation. Varying two phase voltages in dc to three phase converter. 4,352,154, Cl. 363-123.000.

Reich, Stefan. Analyzer apparatus for measuring and adjustment of color filtering effects and/or exposure on making photographic prints. 4,351,607, Cl. 355-35.000.

Reinmuth, Klaus: *See—*
Hunold, Klaus; Reinmuth, Klaus; Lipp, Alfred; Napholcz, Johannes; and Arnold, Peter, 4,351,858, Cl. 427-193.000.

Reisman, Arnold; and Berkenblit, Melvin, to International Business Machines Corporation. Single gas flow elevated pressure reactor. 4,351,805, Cl. 422-202.000.

Reitmeier, Glenn A.; and Dischert, Robert A., to RCA Corporation. Adaptive composite-component transcoding hierarchy for digital video. 4,352,122, Cl. 358-11.000.

Reliability, Inc.: *See—*
Johnson, James E., 4,351,108, Cl. 29-741.000.

Reliable Security Systems, Inc.: *See—*
VanDerLinden, Roy E., 4,351,552, Cl. 292-201.000.

Relium AG: *See—*
Zullig, Harry T., 4,351,588, Cl. 350-259.000.

Remy, Maurice: *See—*
Poncin, Jacques; Rogel, Pierre; and Remy, Maurice, 4,352,126, Cl. 358-167.000.

Renaux, Charley: *See—*
Artaud, Robert; Aubert, Michel; and Renaux, Charley, 4,351,794, Cl. 376-404.000.

Renda, Vince A. Water injection system for internal combustion engines. 4,351,289, Cl. 123-25.00A.

Reneric, Michel E., to Telediffusion de France. Device for acquiring and averaging samples of a noisy periodic signal. 4,352,094, Cl. 340-347.0AD.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,351,496, Cl. 242-107.40A.

Research Corporation: *See—*
Gaafar, Hassan A., 4,351,761, Cl. 260-112.00R.

Research-Cottrell, Inc.: *See—*
Biedell, Edward L.; and Ferb, Robert J., 4,351,804, Cl. 422-170.000.

Reusser, Robert E.; Claytor, Elizabeth A.; and Jones, Brenton E., to Phillips Petroleum Company. Removal of olefin from aliphatic hydrocarbon by treatment with active solid. 4,351,980, Cl. 585-820.000.

Reuther, Albert: *See—*
von der Eltz, Hans-Ulrich; and Reuther, Albert, 4,351,076, Cl. 8-149.100.

Reynolds, Blake: *See—*
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.

Reynolds, Donald K.; and Smithmeyer, Louis P. C. End supportable dipole antenna. 4,352,109, Cl. 343-792.000.

Reynolds, Richard W.; Myers, Allen; and Foley, Daniel J., to Sundstrand Corporation. Electronic constant speed control for a hydrostatic transmission. 4,351,152, Cl. 60-395.000.

Rhone-Poulenc Agrochimie: *See—*
Cordier, Georges, 4,351,959, Cl. 564-412.000.

Rhone Poulenc Inc.: *See—*
Gradeff, Peter S.; and Murayama, Stanley T., 4,351,962, Cl. 568-432.000.

Rhone-Poulenc Industries: *See—*
Boudot, Bernard; Grosbois, Jean; and Pajot, Michel, 4,351,821, Cl. 423-624.000.
Bourdon, Jacques, 4,351,969, Cl. 568-774.000.
Gauthier-Lafaye, Jean; and Perron, Robert, 4,351,953, Cl. 562-519.000.
Ramanadin, R.; Roustan, Alain; and Soula, Gerard, 4,351,777, Cl. 260-465.00G.

Riccar Co., Ltd.: *See—*
Kondo, Shigeki; Iketani, Tomofumi; Yamazaki, Yoshio; Doi, Keiichiro; and Tanaka, Seiji, 4,351,996, Cl. 219-10.49R.

Richardson, Harvey J.: *See—*
DeMoss, Dean; and Richardson, Harvey J., 4,352,135, Cl. 360-133.000.

Richey, Warren F.: *See—*
Ishibe, Nobuyuki; and Richey, Warren F., 4,351,973, Cl. 570-104.000.

Richter, George N.: *See—*
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.

Richter, Helmuth, to Aktiengesellschaft Muhnle, Kopp & Kausch. Feed of the exhaust gases from an internal-combustion engine to the rotor of a centripetal turbine of an exhaust gas turbocharger. 4,351,154, Cl. 60-605.000.

Ricoh Company, Ltd.: *See—*
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, 4,351,604, Cl. 355-4.000.
Mizuta, Toshiaki; Abe, Takeshi; Yoshihara, Ichiro; and Saito, Kazuhito, 4,352,104, Cl. 340-825.150.
Ohori, Tamio; Mastumoto, Fuyuhiko; and Tomita, Satoru, 4,352,128, Cl. 358-294.000.
Tagawa, Kazuaki, 4,351,603, Cl. 355-3.0CH.

Riegel, Herbert; and Huang, Chiung-Yuan, to Lummus Company, The. Recovery of chlorine values in integrated process for oxychlorination and combustion of chlorinated hydrocarbons. 4,351,819, Cl. 423-488.000.

Rieke Corporation: *See—*
Summers, Kenneth L., 4,351,442, Cl. 215-216.000.

Rieman, Willis E.: *See—*
Barry, Leon G.; and Rieman, Willis E., 4,352,082, Cl. 337-409.000.

Riese, Hans M., to Alfa-Laval Inc. Method for freeze-stabilizing wine. 4,351,851, Cl. 426-524.000.

Rigden, Sydney A. R., to General Electric Company Limited, The. Cathodoluminescent light sources and electric lighting arrangements including such sources. 4,352,043, Cl. 315-1.000.

Riker Laboratories, Inc.: *See—*
Barnett, William E., 4,351,938, Cl. 536-21.000.

Rimedio, Nicholas T., Sr.: *See—*
Hohnerlein, Otto G., Jr.; Smith, Willie E., Jr.; and Rimedio, Nicholas T., Sr., 4,351,672, Cl. 127-46.300.

Rines, Robert H.; and Knowles, Albert H. Method of and apparatus for unconfined fish farming and the like. 4,351,269, Cl. 119-3.000.

Rinne, Gerhart; and Heim, Ulrich, to Dragerwerk Aktiengesellschaft. Device for connection to a respiratory gas line. 4,351,327, Cl. 128-200.140.

Ripnyi, Victor: *See—*
Rehme, Wilfried; Stipura, Anatoly; Ripnyi, Victor; Donskoi, Leonid; and Schevtschenko, Nikolai, 4,351,190, Cl. 73-638.000.

Rittershaus & Blecher GmbH: *See—*
Rademacher, Karl A.; and Oelbermann, Max, 4,351,725, Cl. 210-230.000.

Robbins, Roland W., Jr. Radiant energy tracker. 4,351,319, Cl. 126-425.000.

Robert Bosch GmbH: *See—*
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.
Drexel, Peter; Maier, Gernot; and Leisner, Ernst, 4,351,628, Cl. 414-749.000.
Grozinger, Alfred; Frister, Manfred; and Kreuzer, Helmut, 4,351,102, Cl. 29-596.000.
Haug, Gerhard; and Siegel, Heinz, 4,351,363, Cl. 138-30.000.
Herden, Werner, 4,352,085, Cl. 338-42.000.
Salzer, Richard; and Schwering, Hans-Ulrich, 4,351,733, Cl. 210-738.000.
Schleupen, Richard; Kaufmann, Reinhold; and Raff, Dieter, 4,351,309, Cl. 123-630.000.
Schweizer, Kurt, 4,351,304, Cl. 123-585.000.
Wessel, Wolf; and Engel, Gerhard, 4,352,032, Cl. 307-515.000.
Zirps, Wilhelm, 4,352,035, Cl. 310-80.000.

Roberts, Charles W.; Lindner, Daniel J.; Kwee, Henry T.; Kolowski, Michael A.; and Fetty, Harold D., to Goodyear Tire & Rubber Company, The. Tread for pneumatic tire. 4,351,381, Cl. 152-209.00R.

Roberts, Peter B.: *See—*
White, David J.; and Roberts, Peter B., 4,351,156, Cl. 60-737.000.

Robertson, Arthur B., to Mobil Oil Corporation. Shaped articles from poly(p-methylstyrene) blends. 4,351,884, Cl. 204-159.120.

Robinson Nugent, Inc.: *See—*
Emerson, James A.; Ramsey, James M.; and Buck, Kerry O., 4,351,582, Cl. 339-97.00R.

Robson, Charles H. Pollen trap. 4,351,074, Cl. 6-1.000.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m. b. H. Pull-out guide assembly for drawers. 4,351,575, Cl. 308-3.800.

Rockwell International Corporation: *See—*
Cunningham, Vernon R., 4,352,075, Cl. 333-28.00R.
Harrington, Timothy A., 4,352,072, Cl. 330-149.000.

Rodenbeck, Philip G., to General Electric Company. Method and apparatus for supporting slot liner cuffs during coil insertion. 4,351,103, Cl. 29-596.000.

Rodolakis, Michael S., to AMS Industries, Inc. Trash barrel. 4,351,539, Cl. 280-47.260.

Roesler, Frank C.: *See—*
Bailey, Martin; Hines, David A.; Ousby, John C.; and Roesler, Frank C., 4,351,730, Cl. 210-629.000.

Roesner, Keith G., to Deere & Company. Paint spraying assembly. 4,351,863, Cl. 427-421.000.

Roessler, Franz: *See—*
Hermanutz, Peter; and Roessler, Franz, 4,352,146, Cl. 361-428.000.

Rogachev, Viktor I.; Trakhtenberg, Lev I.; and Shkatov, Petr N. Nondestructive electromagnetic inspection of pipelines incorporated in an electrically closed loop. 4,352,065, Cl. 324-238.000.

Rogard, Roger. Method and device for detecting and interpreting a distress signal. 4,352,199, Cl. 455-31.000.

Rogel, Pierre: *See—*
Poncin, Jacques; Rogel, Pierre; and Remy, Maurice, 4,352,126, Cl. 358-167.000.

Rogier, Leonce, to Valeo. Method for limited, gradual disengagement of a brake, and such a brake. 4,351,423, Cl. 188-216.000.

Rogier, Leonce E. R.: *See—*
Depoisier, Jean-Claude; and Rogier, Leonce E. R., 4,351,885, Cl. 428-544.000.
ROHCO, Inc.: *See—*
Guhde, Donald J., 4,351,675, Cl. 148-6.15R.
Rohm GmbH: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,351,639, Cl. 8-94.160.
Rohm and Haas Company: *See—*
Arkens, Charles T., 4,351,875, Cl. 428-290.000.
Chan, Hak-Foon, 4,351,839, Cl. 424-269.000.
Dupre, Jean, 4,351,754, Cl. 524-445.000.
Romey, Ingo; and Trojan, Willi, to Bergwerksverband GmbH. Sound absorbent panel. 4,351,739, Cl. 252-62.000.
Roneo Alcatel Limited: *See—*
Clark, Leslie, 4,351,685, Cl. 156-234.000.
Rood, William E., Jr. Air filtering system and method of operation. 4,351,476, Cl. 237-50.000.
Ropp, Richard C., to Vitrex Corporation. Molecular glasses for nuclear waste encapsulation. 4,351,749, Cl. 252-629.000.
Rose, Denis A.: *See—*
Verderber, Joseph A.; Fortcamp, James A.; McInturff, Ace; and Rose, Denis A., 4,352,012, Cl. 235-487.000.
Rosenberg, Arnold M.; Gaidis, James M.; and Kindt, Lawrence J., to W. R. Grace & Co. Water reducing agent with reduced air. 4,351,671, Cl. 106-90.000.
Rosenfeldt, Wolfgang, to Sybron Corporation. Priority system dental instrument delivery. 4,351,634, Cl. 433-28.000.
Ross, Louis, to Borg-Warner Corporation. Accessory drive assembly with compact gear differential. 4,351,204, Cl. 74-804.000.
Ross, Tsuneyo. Inflatable apparatus and methods of constructing and utilizing same. 4,351,544, Cl. 280-743.000.
Rossi, Alessandro: *See—*
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,351,829, Cl. 424-177.000.
Rotaque (Proprietary) Limited: *See—*
Brouwer, Cornelis, 4,351,243, Cl. 105-241.200.
Roustan, Alain: *See—*
Ramanadin, R.; Roustan, Alain; and Soula, Gerard, 4,351,777, Cl. 260-465.00G.
Rovetta, Alberto; Franchetti, Ilario; and Vicentini, Pietro, to Alfa Romeo S.p.A. Multi-purpose mechanical hand. 4,351,553, Cl. 294-106.000.
Rowe International, Inc.: *See—*
Scalera, Frank T.; and Sloss, Andris C., 4,351,452, Cl. 221-11.000.
Rowley, Larry W.: *See—*
McJunkin, Howard P., Jr.; and Rowley, Larry W., 4,352,148, Cl. 362-61.00).
Rozenblad, William L. Multiple use exercising devices. 4,351,525, Cl. 272-93.000.
Rozzo, Nancy A.: *See—*
Buddemeyer, Bruce D.; Neville, William A.; Rozzo, Nancy A.; and Bourne, Richard G., 4,351,735, Cl. 252-1.000.
RTE Corporation: *See—*
Du Pont, John P.; Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., 4,352,139, Cl. 361-117.000.
Rubin, David, to Schwimmer, Adolf W.; Schwartz, Irwin S.; and Rubin, David. Diagnosis of tumors or bacterial infections having β-glucuronidase activity. 4,351,823, Cl. 424-9.000.
Rule, Charles E.; Gilmore, Cecilia; and Stefanski, Eugene J., to SCM Corporation. Low calorie cake batter or mix. 4,351,852, Cl. 426-554.000.
Runyan, Steven R.: *See—*
Link, William T.; Runyan, Steven R.; and Hobson, Stephen, 4,351,592, Cl. 353-72.000.
Ruszala, Frederick B.: *See—*
Schultz, Edward R., Jr.; Cook, Kenneth J.; Power, Joseph S.; and Ruszala, Frederick B., 4,352,163, Cl. 364-801.000.
Rutger, J. Neil; and Carnahan, Howard L., to United States of America, Agriculture. Recessive tall—a fourth genetic element to facilitate hybrid cereal production. 4,351,130, Cl. 47-58.000.
Ryan, Jerry E.; and Grove, Edward E., to Tranter, Inc. Sootblower for economizer. 4,351,277, Cl. 122-390.000.
Rybin, Vladimir S.: *See—*
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.
Rydwansky, Frank C., Jr.: *See—*
Kirkman, Michael; Rydwansky, Frank C., Jr.; Hanlon, Richard J.; and Petersen, Richard W., 4,351,580, Cl. 339-17.0CF.
S&C Electric Company: *See—*
Evans, David M.; and Swanson, Roy T., 4,351,994, Cl. 200-153.0SC.
S&S Corrugated Paper Machinery Co., Inc.: *See—*
Flaum, Stephen S.; and Leff, Martin J., 4,351,264, Cl. 118-203.000.
Sabco Limited: *See—*
Smyth, Donald N., 4,351,360, Cl. 137-624.120.
Sabin, Darrell L. Terrarium/aquarium. 4,351,270, Cl. 119-5.000.
Sachs, George A.: *See—*
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Sachs, Herbert K.; and Sachs, George A. Mechanism for generating power from wave motion on a body of water. 4,352,023, Cl. 290-42.000.
Sahara, Hiroshi: *See—*
Okada, Takashi; Sahara, Hiroshi; and Otsuka, Fumikazu, 4,352,057, Cl. 323-315.000.
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Saisu, Naoki: *See—*
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Saito, Kazuhito: *See—*
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Saito, Masaaki: *See—*
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Saito, Syuichiro: *See—*
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Saitoh, Takeshi; Hatashita, Hiroshi; Nagashima, Toshio; and Yamamoto, Susumu, to Hitachi, Ltd. Band pass filters. 4,352,076, Cl. 333-204.000.
Saka, Tatsuo: *See—*
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Sakaguchi, Shigeki: *See—*
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Sakakibara, Yukio: *See—*
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Sakano, Tetsurou, to Fujitsu Fanuc Limited. Method and apparatus for error correction in position sensing circuit. 4,352,050, Cl. 318-661.000.
Sakurada, Nobuaki: *See—*
Date, Nobuaki; Sakurada, Nobuaki; and Shimizu, Masami, 4,351,595, Cl. 354-173.000.
Sakurai, Tadashi: *See—*
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Sakuta, Youichi: *See—*
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Salzer, Richard; and Schwering, Hans-Ulrich, to Robert Bosch GmbH. Process and apparatus for purification of industrial waste water. 4,351,733, Cl. 210-738.000.
Sambursky, Sergei S.: *See—*
Laptev, Lev N.; Legotsky, Sergei S.; Semenovsky, Viadimir A.; Sambursky, Sergei S.; Litvinov, Abram B.; and Kondrashov, Alexei I., 4,351,489, Cl. 241-261.300.
Samurin, Norman A.: *See—*
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Sanchez, Terry J.: *See—*
Kerkenbush, Darle L.; Whittington, Jimmie L.; and Sanchez, Terry J., 4,351,129, Cl. 46-74.00D.
Sanders Associates, Inc.: *See—*
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Sanderson, Michael L.: *See—*
Gray, John O.; and Sanderson, Michael L., 4,351,189, Cl. 73-196.000.
Sandino, Hector M. Ice skate attachment. 4,351,536, Cl. 280-7.130.
Sandoz Ltd.: *See—*
Hasspacher, Klaus, 4,351,838, Cl. 424-267.000.
Sangamo Weston, Inc.: *See—*
Dyer, Robert E.; and Carney, Murray C., 4,352,009, Cl. 235-92.0ST.
Elias, William H.; and Granger, Harold M., 4,352,147, Cl. 361-433.000.
Santner, Fritz, to Elin-Union A.G. Sealed generator housing. 4,352,037, Cl. 310-89.000.
Sanyo Electric Co., Ltd.: *See—*
Fujishima, Kunihiro; and Kuramoto, Takaki, 4,352,000, Cl. 219-10.770.
Iwata, Mitsuo; Masuda, Naomasa; Uraki, Hideki; and Tsuchino, Kunio, 4,351,498, Cl. 242-204.000.
Ohgishi, Tsutomu; and Sakurai, Tadashi, 4,352,204, Cl. 455-182.000.
Sanzenbacher, Charles W., to Midrex Corporation. Direct reduction of iron using coke oven gas. 4,351,513, Cl. 266-156.000.
Sapino, Chester: *See—*
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,351,766, Cl. 260-239.100.
Sarvestany, Asadollah A.: *See—*
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda, 4,351,485, Cl. 241-36.000.
Sasaki, Isao: *See—*
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Satharasinghe, Dayananda: *See—*
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda, 4,351,485, Cl. 241-36.000.
Sato, Hiroyuki: *See—*
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Sato, Katsuhiko: *See—*
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Sato, Makoto: *See—*
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Sauerbrey, Arnim: *See—*
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Savannah Foods & Industries, Inc.: *See—*
Hohnerlein, Otto G., Jr.; Smith, Willie E., Jr.; and Rimedio, Nicholas T., Sr., 4,351,672, Cl. 127-46.300.
Savelieva, Nina A.: *See—*
Daiker, Artur L.; Veis, Anatoly I.; Kochengin, Evgeny Y.; Novoselov, Nikolai M.; Morozov, Gennady Y.; Rybin, Vladimir S.; Belokur, Nikolai A.; and Savelieva, Nina A., 4,351,676, Cl. 148-9.00C.
Savin Corporation: *See—*
Landa, Benzion, 4,351,617, Cl. 400-118.000.
Sawchuk, Alexander A.: *See—*
Chavel, Pierre H.; Sawchuk, Alexander A.; Soffer, Bernard H.; Strand, Timothy C.; and Tanguay, Armand R., Jr., 4,351,589, Cl. 350-342.000.
Scagliola, Carlo: *See—*
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Scarberry, Eugene N. Emergency internal defibrillation. 4,351,330, Cl. 128-207.150.
Schaffer, Ortwin; and Herrmann, Manfred. Dye powder formulation. 4,351,640, Cl. 8-524.000.
Schalke, Peter M.: *See—*
Kleemann, Axel; and Schalke, Peter M., 4,351,778, Cl. 260-465.80R.
Scharf, Bella. Method of making modular yarncraft. 4,351,093, Cl. 28-149.000.
Scheff, Victor A.: *See—*
Middleman, Lee M.; Evans, Joseph H.; Blake, Arthur E.; and Scheff, Victor A., 4,352,083, Cl. 338-23.000.
Scherwarth, Manfred. Fast closing valve for gaseous and liquid media. 4,351,359, Cl. 137-521.000.
Schevtschenko, Nikolai: *See—*
Rehme, Wilfried; Stipura, Anatoly; Ripnyi, Victor; Donskoi, Leonid; and Schevtschenko, Nikolai, 4,351,190, Cl. 73-638.000.
Schippers, Heinz; Munnekehoff, Gerd; and Teich, Udo, to Barmag Barmer Maschinenfabrik. Bobbin transport apparatus and method. 4,351,494, Cl. 242-35.50A.
Schlaich, Jorg: *See—*
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; and Schlaich, Jorg, 4,352,112, Cl. 343-915.000.
Schleupen, Richard; Kaufmann, Reinhold; and Raff, Dieter, to Robert Bosch GmbH. Safety gap for an ignition system in an internal combustion engine. 4,351,309, Cl. 123-630.000.
Schleyerbach, Rudolf: *See—*
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Schlichte, Max; and Springstubbe, Wolf, to Siemens Aktiengesellschaft. Coupling system for a telecommunication exchange installation. 4,351,985, Cl. 179-18.0GF.
Schlumberger Technology Corporation: *See—*
Moulin, Pierre A., 4,351,186, Cl. 73-151.000.
Schmid, Hans R.: *See—*
Egelhof, Dieter; and Schmid, Hans R., 4,351,728, Cl. 210-415.000.
Schmidberger, Rainer, to Dornier System GmbH. Oxygen sensor for monitoring exhaust gases. 4,351,182, Cl. 73-27.00R.
Schmidt, Alfred: *See—*
Stritt, Helmut; Schmidt, Alfred; and Leible, Erwin, 4,351,620, Cl. 403-13.000.
Schmidt, Edward M., to United States of America, Army. Burst fire compensator. 4,351,223, Cl. 89-14.00R.
Schmidt, Hans-Joachim; and Leupold, Ernst I., to Hoechst Aktiengesellschaft. Process for the manufacture of acetic acid, acetic aldehyde and ethanol from synthesis gas. 4,351,908, Cl. 518-716.000.
Schmidt, Paul J.: *See—*
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Schmitt, Manfred: *See—*
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Schmitz, Klaus: *See—*
Kubbeler, Hans K.; Erpenbach, Heinz; Gehrmann, Klaus; and Schmitz, Klaus, 4,351,972, Cl. 570-101.000.
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, to J. M. Voith GmbH; and Dyckerhoff & Widman AG. Process and a grinding stone for preparing mechanical wood pulp. 4,351,486, Cl. 241-67.000.
Schoenwetter, Randall R.: *See—*
Du Pont, John P.; Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., 4,352,139, Cl. 361-117.000.
Schoonover, Larry G., to Dresser Industries, Inc. System and method for visual display of well-logging data. 4,352,166, Cl. 367-69.000.
Schopper, Bernd, to ITT Industries, Inc. Dual-circuit pressure control valves for brake systems. 4,351,571, Cl. 303-40.000.
Schramm, Werner, to PFP-Anstalt Fur Produktentwicklung und Verwertung. Display stand for garments. 4,351,441, Cl. 211-207.000.
Schreurs, Gustaaf J., to Mosa, B.V. Method for the manufacture of cleaving tiles. 4,351,788, Cl. 264-67.000.
Schroeder, Daniel R., to Motorola, Inc. Automatic IF selectivity for radio receiver system. 4,352,208, Cl. 455-266.000.
Schultz, Edward C.; and Stevenson, Robert K. Racket handle. 4,351,529, Cl. 273-75.000.
Schultz, Edward R., Jr.; Cook, Kenneth J.; Power, Joseph S.; and Ruszala, Frederick B., to Valeron Corporation, The. Vectorcardiogram simulator. 4,352,163, Cl. 364-801.000.
Schultz, Raymond J.; and Marr, Michael E., to General Motors Corporation. Power assist rack and pinion steering gear. 4,351,228, Cl. 92-128.000.
Schulz, David A., to Union Carbide Corporation. Method for producing a mesophase pitch derived carbon yarn and fiber. 4,351,816, Cl. 423-447.400.
Schulz, Horst: *See—*
Tappert, Hans-Jurgen; Schulz, Horst; Johne, Hans; and Johne, Albrecht, 4,351,237, Cl. 101-216.000.
Schulze, Dieter M. O. T., to Ontrax Corporation. Electromagnetic actuator apparatus. 4,352,048, Cl. 318-135.000.
Schulze, Elmar. Digital time-division multiplex telecommunication system. 4,352,180, Cl. 370-58.000.
Schulze, Wallace M., to General Electric Company. Auxiliary air system for gas turbine engine. 4,351,150, Cl. 60-226.00R.
Schumacher, Frank A., to General Electric Company. Energy recovery system. 4,351,159, Cl. 62-79.000.
Schwartz, Irwin S.: *See—*
Rubin, David, 4,351,823, Cl. 424-9.000.
Schwartz, Jack M. Apparatus for making a tufted product. 4,351,691, Cl. 156-435.000.
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Schwarz, Cornelia: *See—*
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Schweizer, Arthur A.: *See—*
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Schweizer, Kurt, to Robert Bosch GmbH. Fuel injection valve. 4,351,304, Cl. 123-585.000.
Schwering, Hans-Ulrich: *See—*
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SCM Corporation: *See—*
Rule, Charles E.; Gilmore, Cecilia; and Stefanski, Eugene J., 4,351,852, Cl. 426-554.000.
Scott, Floyd L., Jr., to BJ-Hughes Inc. Apparatus for making multiple orientation measurements in a drill string. 4,351,116, Cl. 33-307.000.
Scribner, Albert W. Pneumatic feeder for punch presses and the like. 4,351,462, Cl. 226-150.000.
Sea-Land Service, Inc.: *See—*
Brickner, Laurence R.; Moutner, David N.; and Pratt, Barbara J., 4,351,230, Cl. 98-31.000.
Sealed Power Corporation: *See—*
Anderson, David L.; and Joseph, A. David, 4,351,550, Cl. 285-158.000.
Seaward International, Inc.: *See—*
Brown, Louis S., Jr., 4,351,257, Cl. 114-219.000.
Sebring, Robert E.; and Coplan, Myron J., to Albany International Corp. Method of fabrication of coreless hollow filament separatory module. 4,351,092, Cl. 28-100.000.
Sedco, Inc.: *See—*
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Seiz, Carl G.: *See—*
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Seiz, Frederick G.; and Seiz, Carl G., to Variable Control Systems, Inc. Speed retarder. 4,351,417, Cl. 187-81.000.
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Selestam, Berndt; Forssell, Ake; and Winnersjo, Per A., to Linden-Alimak AB. Apparatus for automatic bolting in rock reinforcement. 4,351,625, Cl. 405-303.000.
Selvidge, Richard H.; and Clark, Dewey. LP Gas carburetor. 4,351,300, Cl. 123-527.000.
Semenovsky, Vladimir A.: *See—*
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Senturia, Stephen D.: *See—*
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Sexstone, John H.; Lewis, Tom; and Milliner, Ken, to Brown & Williamson Tobacco Corporation. Apparatus for making grooves in tobacco smoke filters. 4,351,792, Cl. 264-293.000.

Shackleford, Geoffrey G.: *See*—
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Shah, Praful K.: *See*—
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Shakhtarin, Valentin N.: *See*—
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Shanefield, Daniel J.; and Verdi, Fred W., to Western Electric Company, Inc. Printed wiring boards. 4,351,697, Cl. 156-643.000.

Shanks, Forrest E., to Sedco, Inc. Riser recoil preventer system. 4,351,261, Cl. 114-264.000.

Sharkey, William H.: *See*—
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Sharp, James M.: *See*—
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Sharp Kabushiki Kaisha: *See*—
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Shell Oil Company: *See*—
Willis, Carl L.; and Slaugh, Lynn H., 4,351,955, Cl. 562-579.000.

Sherwood, John H.: *See*—
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Shiao, Daniel D.: *See*—
Altland, Henry W.; and Shiao, Daniel D., 4,351,896, Cl. 430-354.000.

Shibata, Toshihiro: *See*—
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Minagawa, Motonubu, 4,351,915, Cl. 524-103.000.

Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, to Asahi Chemical Industry Co., Ltd. Tetrazole derivative. 4,351,947, Cl. 548-251.000.

Shida, Masaharu: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,352,172, Cl. 368-76.000.

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Shimamoto, Mamoru: *See*—
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Shimazu, Kyotaro: *See*—
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Shimizu, Masami: *See*—
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Shindome, Mamoru; Yanagita, Takanori; Nakamura, Takanori; and Otsuji, Hiroyuki, to Asahi Engineering Co. Ltd. Method for treating water solution of waste material containing salt of smelt-water explosion characteristic. 4,351,252, Cl. 110-346.000.

Shinjo, Masayoshi: *See*—
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Shinoda, Naoharu; Maeda, Nobutaka; and Kubo, Kyoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Exhaust gas desulfurization apparatus. 4,351,650, Cl. 55-181.000.

Shionogi & Co., Ltd.: *See*—
Ogata, Masaru; and Matsumoto, Hiroshi, 4,351,770, Cl. 548-567.000.

Shiraki, Yasuhiro: *See*—
Matsui, Makoto; Shiraki, Yasuhiro; Katayama, Yoshifumi; Tsukada, Toshihisa; and Maruyama, Eiichi, 4,351,856, Cl. 427-38.000.

Shirasaki, Shinji; Yamada, Takashi; and Shimamoto, Mamoru, to Nippondenso Co., Ltd. Process of controlling the current flowing period of an ignition coil. 4,351,287, Cl. 123-609.000.

Shitomi, Makoto: *See*—
Nishide, Teruyuki; Naoi, Takayuki; Shitomi, Makoto; Hamada, Keiichi; and Noguchi, Hidetami, 4,351,576, Cl. 308-37.000.

Shively, Jesse E., to Pfizer Inc. Method of increasing feed efficiency in swine. 4,351,845, Cl. 424-283.000.

Shkatov, Petr N.: *See*—
Rogachev, Viktor I.; Trakhtenberg, Lev I.; and Shkatov, Petr N., 4,352,065, Cl. 324-238.000.

Shlykov, Gennady N.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Shoulis, John E.: *See*—
Enyart, Charles E.; and Shoulis, John E., 4,351,137, Cl. 52-202.000.

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Yoshida, Tooru; Iwagami, Seigo; Ueshima, Takashi; and Hosoda, Yoshikazu, 4,351,922, Cl. 525-116.000.

Shuman, Robert T.: *See*—
Geselchen, Paul D.; and Shuman, Robert T., 4,351,763, Cl. 260-112.50E.

Sidles, James; and Blayne, Jerome J., to B. F. Goodrich Company, The. Mold and process for molding. 4,351,789, Cl. 264-130.000.

Sidman, Kenneth R., to Arthur D. Little, Inc. Biodegradable, implantable drug delivery device, and process for preparing and using the same. 4,351,337, Cl. 128-260.000.

Siecor Corporation: *See*—
Patel, Naren I., 4,351,913, Cl. 523-218.000.

Siegel, Heinz: *See*—
Haug, Gerhard; and Siegel, Heinz, 4,351,363, Cl. 138-30.000.

Siemens Aktiengesellschaft: *See*—
Hieber, Konrad; and Mayer, Norbert, 4,351,695, Cl. 156-603.000.
Hunziker, Walter, 4,352,086, Cl. 340-35.000.
Lorenz, Hans P.; and Wengert, Rolf, 4,352,042, Cl. 313-485.000.
Luxa, Gunther, 4,351,989, Cl. 200-48.0CB.
Schlichte, Max; and Springstubbe, Wolf, 4,351,985, Cl. 179-18.0GF.
Voss, Peter, 4,352,028, Cl. 307-252.00A.
Waerve, Hans, 4,352,197, Cl. 378-177.000.
Widmann, Dietrich, 4,351,100, Cl. 29-577.00C.
Winzer, Gerhard; and Auracher, Franz, 4,351,585, Cl. 350-96.150.

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Sigma Development Corp.: *See*—
Smith, Harvey A., 4,351,378, Cl. 144-193.00A.

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Mahoney, Paul F.; and Bonn, Jerrold L., 4,352,029, Cl. 307-317.00R.

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Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,351,766, Cl. 260-239.100.

Simms, Jack C., deceased; and Old National Bank in Evansville, administrator, to Mead Johnson & Company. Spiro-quaternary ammonium halides and N-(2-pyrimidinyl)piperazinylalkylazaspiroalkanedione process. 4,351,939, Cl. 544-230.000.

Simms, John A.: *See*—
Brixius, Darryl W.; and Simms, John A., 4,351,755, Cl. 524-555.000.

Simon, Wayne E. Deceleration apparatus for safety nets. 4,351,413, Cl. 182-139.000.

Simonson, Kent L.: *See*—
Leining, Lyndon R.; Fischer, Nathan A.; Simonson, Kent L.; White, Gordon G.; and Lindstrom, Oscar H., 4,351,088, Cl. 17-50.000.

Simonson, Theodore K. Foldable gaff hook. 4,351,126, Cl. 43-5.000.

Simonsson, Sven B., to Aktiebolaget Electrolux. Vacuum cleaning nozzle. 4,351,083, Cl. 15-373.000.

Simpson, Harold G., to Wickes Corporation, The. End lap seam construction for standing seam roof panels. 4,351,140, Cl. 52-542.000.

Sing, Edmond L. Blend of normal and mutant *Streptococcus diacetilactis*. 4,351,904, Cl. 435-253.000.

Singer Company, The: *See*—
Brown, Jack, 4,351,254, Cl. 112-158.00E.
Nalley, David J., 4,351,112, Cl. 30-392.000.
Taylor, Allen R., 4,351,194, Cl. 74-5.370.

Sircar, Ila, to Warner-Lambert Company. Anti-arteriosclerotic agents. 4,351,950, Cl. 560-62.000.

Sirvet, Enn: *See*—
Skrypek, John P.; Williams, Robert; and Sirvet, Enn, 4,351,610, Cl. 355-86.000.

Siver, Chester A. Valve with yoke and captive gland wrench. 4,351,512, Cl. 251-214.000.

Sivertsen, John W., to Peterson, Carlton F., a part interest. Fish line bobber/sinker. 4,351,128, Cl. 43-44.910.

Sivertsen, Marvin L.; and Sobolewski, Valentine S., to General Electric Company. Film mount with protected face sheet. 4,351,124, Cl. 40-158.00B.

Skrypek, John P.; Williams, Robert; and Sirvet, Enn, to Sun Chemical Corporation. Photocomposer. 4,351,610, Cl. 355-86.000.

Slagel, John E.; and Howard, Allen C., to Phillips Petroleum Company. Carbon black process. 4,351,817, Cl. 423-450.000.

Slater, Billy R., to Forney Engineering Company. Industrial control system. 4,352,103, Cl. 340-825.010.

Slaugh, Lynn H.: *See*—
Willis, Carl L.; and Slaugh, Lynn H., 4,351,955, Cl. 562-579.000.

Sloss, Andris C.: *See*—
Scalera, Frank T.; and Sloss, Andris C., 4,351,452, Cl. 221-11.000.

Smith, Don W.: *See*—
Ackerman, Dean C.; and Smith, Don W., 4,351,082, Cl. 15-316.00R.

Smith, Harry A., to Dow Chemical Company, The. Curable hydroxy functional resin compositions containing reactive diluents. 4,351,928, Cl. 525-443.000.

Smith, Harvey A., to Sigma Development Corp. Hydraulic logsplitter assembly. 4,351,378, Cl. 144-193.00A.

Smith, Marc, to Automatic Solar Covers, Inc. Semi-automatic pool cover. 4,351,072, Cl. 4-503.000.

Smith, Stephen H., to Hybricon Inc. High speed non-saturating inverter. 4,352,152, Cl. 363-41.000.

Smith, Willie E., Jr.: *See*—
Hohnerlein, Otto G., Jr.; Smith, Willie E., Jr.; and Rimedio, Nicholas T., Sr., 4,351,672, Cl. 127-46.300.

Smithmeyer, Louis P. C.: *See*—
Reynolds, Donald K.; and Smithmeyer, Louis P. C., 4,352,109, Cl. 343-792.000.

Smolin, William, to Texaco Inc. Separation of para-xylene. 4,351,981, Cl. 585-828.000.

Smyth, Donald N., to Sabco Limited. Fluid timer. 4,351,360, Cl. 137-624.120.

Sneider, Vincent R. Twist bottle dispenser. 4,351,336, Cl. 128-232.000.

Sneider, Vincent R. Tampon with a protective accordion-style cover. 4,351,339, Cl. 128-285.000.

Snyder, John E.: *See*—
Cross, James A.; and Snyder, John E., 4,352,207, Cl. 455-223.000.

Sobolewski, Valentine S.: *See*—
Sivertsen, Marvin L.; and Sobolewski, Valentine S., 4,351,124, Cl. 40-158.00B.
Societa Italiana Vetro-SIV-S.p.A.: *See*—
Zega, Bogdan, 4,352,006, Cl. 219-219.000.
S.A. des Etablissements Staubli: *See*—
Palau, Joseph, 4,351,368, Cl. 139-324.000.
Societe Anonyme Francaise du Ferodo: *See*—
Chauve, Jean, 4,351,422, Cl. 188-170.000.
Depoisier, Jean-Claude; and Rogier, Leonce E. R., 4,351,885, Cl. 428-544.000.
Societe d'Assistance Technique pour Porduits Nestle S.A.: *See*—
Mattisson, Lennart; and Ganrot, Bertil, 4,351,997, Cl. 219-10.55E.
Societe Industrielle de Brevets et d'Etudes SIBE: *See*—
Arnaud, Gaston, 4,351,280, Cl. 123-415.000.
Societe Italiana Vetro-Siv-S.p.A.: *See*—
Kalbskopf, Reinhard; and Baumberger, Otto, 4,351,267, Cl. 118-718.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Labruyere, Gilles, 4,352,113, Cl. 343-915.000.
Soffer, Bernard H.: *See*—
Chavel, Pierre H.; Sawchuk, Alexander A.; Soffer, Bernard H.; Strand, Timothy C.; and Tanguay, Armand R., Jr., 4,351,589, Cl. 350-342.000.
SOHIO: *See*—
Prem, Dorothy C.; Duke, June T.; and Isley, Ralph E., 4,351,756, Cl. 524-314.000.
Sohner, Gerhard: *See*—
Adler, Karl-Heinz; Pfaff, Georg; Leussink, Reinhard; Sohner, Gerhard; Hohne, Gerd; Jokh, Thomas; and Decker, Heinz, 4,351,310, Cl. 123-644.000.
Solar Energy of Colorado, Inc.: *See*—
Jones, Richard D., 4,351,161, Cl. 62-235.100.
Solie, James C.; and McClocklin, Samuel B., to Owatonna Tool Company. Rotary valve. 4,351,362, Cl. 137-625.650.
Solomon, Paul W.: *See*—
Ray, Gardner C.; and Solomon, Paul W., 4,351,963, Cl. 568-477.000.
Somerville, Robert L. Traveling belt filter having vacuum channels formed along edges of said belt. 4,351,726, Cl. 210-401.000.
Sommer, August; Heitmann, Wilhelm; and Brucker, Rainer, to Veba-Chemie Aktiengesellschaft. Method of preparing alcohols having two to four carbon atoms by catalytic hydration of olefins. 4,351,970, Cl. 568-895.000.
Sone, Takanori: *See*—
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,351,947, Cl. 548-251.000.
Sonnek, Martin, to U.S. Philips Corporation. Tape tension control for a tape recorder. 4,351,493, Cl. 242-190.000.
Sontek Industries, Inc.: *See*—
Bodai, Balaza I., 4,351,328, Cl. 128-202.160.
Sony Corporation: *See*—
Imayasu, Tomoyoshi; and Isono, Katsuo, 4,352,047, Cl. 315-370.000.
Miyake, Masayuki; Sekino, Takeo; and Takeda, Masashi, 4,352,027, Cl. 307-221.00R.
Okada, Takashi; Sahara, Hiroshi; and Otsuka, Fumikazu, 4,352,057, Cl. 323-315.000.
Sothmann, Gunnar A.; and Marttila, Esko V., to Orion-yhtyma Oy. Process for the preparation of tablets with retarded liberation of the active agent is predetermined. 4,351,825, Cl. 424-19.000.
Soula, Gerard: *See*—
Ramanadin, R.; Roustan, Alain; and Soula, Gerard, 4,351,777, Cl. 260-465.00G.
Sovra S.A.: *See*—
Azzolini, Georges P., 4,351,211, Cl. 83-861.000.
Sparks, Robert A.: *See*—
Boyd, Douglas P.; Herrmannsfeldt, William B.; Quinn, James R.; and Sparks, Robert A., 4,352,021, Cl. 378-12.000.
Sperry Corporation: *See*—
Foulks, Alan L.; and Larson, Gary O., 4,351,187, Cl. 73-178.00R.
Sperry, Timothy P.: *See*—
Mueller, Dale A.; and Sperry, Timothy P., 4,352,079, Cl. 336-65.000.
Spitnale, Gregory G.: *See*—
Milberger, Ernest C.; Lemanski, Michael F.; and Spitnale, Gregory G., 4,351,773, Cl. 549-259.000.
Spivack, John D., to Ciba-Geigy Corporation. Alkylated 2,2'-biphenylene phosphites and stabilized compositions. 4,351,759, Cl. 524-100.000.
Sprecher & Schuh AG: *See*—
Graf, Rudolf, 4,351,993, Cl. 200-148.00A.
Sprecker, Mark A., to International Flavors & Fragrances Inc. Organoleptic uses of norbornyl ethers and esters. 4,351,347, Cl. 131-276.000.
Sprecker, Mark A., to International Flavors & Fragrances Inc. Norbornyl ether preparation. 4,351,965, Cl. 568-665.000.
Springstubbe, Wolf: *See*—
Schlichte, Max; and Springstubbe, Wolf, 4,351,985, Cl. 179-18.0GF.
Stacy, Galen D.: *See*—
Likins, Merle R., Jr.; and Stacy, Galen D., 4,351,818, Cl. 423-450.000.
Staedeli, Otto, to Maag Gear-Wheel & Machine Co. Ltd. Drive system for marine vessels. 4,351,635, Cl. 440-75.000.
Stallings, Charles K.: *See*—
Holland, Eddie L.; Stallings, Charles K.; and Parker, Jack, 4,351,273, Cl. 119-51.00R.
Stamicarbon, B.V.: *See*—
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,351,807, Cl. 423-24.000.
Stamm, Klaus: *See*—
Geiger, Istvan; Theuerkauf, Heinz; and Stamm, Klaus, 4,351,281, Cl. 123-425.000.
Stampfli, Harald. Valve with servo-command. 4,351,509, Cl. 251-38.000.
Standard Oil Company, The: *See*—
Milberger, Ernest C.; Lemanski, Michael F.; and Spitnale, Gregory G., 4,351,773, Cl. 549-259.000.
Standard Products Company, The: *See*—
Giannakidis, Dimitrios, 4,351,864, Cl. 428-31.000.
Stanko, Ronald T., to Montefiore Hospital. Method for preventing body fat deposition in mammals. 4,351,835, Cl. 424-252.000.
Stanley Works, The: *See*—
Clark, David F., 4,351,686, Cl. 156-329.000.
Suska, Charles R., 4,351,085, Cl. 16-273.000.
Stant Inc.: *See*—
Crute, Billy G., 4,351,350, Cl. 137-39.000.
Starcote Limited: *See*—
Kent, Brian, 4,352,141, Cl. 361-181.000.
Starnes, Roger L.; Henson, Ernest D.; Wilkes, Thomas J.; and Sharp, James M., to Teledyne Industries, Incorporated. Player piano recording system. 4,351,221, Cl. 84-1.280.
Statkus, Frank D., to Boeing Company, The. Continuous skin, variable camber airfoil edge actuating mechanism. 4,351,502, Cl. 244-219.000.
Stauffer Chemical Company: *See*—
Felix, Raymond A., 4,351,665, Cl. 71-103.000.
Giolito, Silvio L.; and Mirviss, Stanley B., 4,351,780, Cl. 260-974.000.
Magee, Walter L., Jr., 4,351,775, Cl. 260-429.00R.
Steddum, Riddle E.: *See*—
Ray, Donald R.; and Steddum, Riddle E., 4,351,258, Cl. 114-230.000.
Stefanska, Barbara J.; Falkowski, Leonard S.; and Borowski, Edward, to Politechnika Gdanska. N-Glycosyl derivatives of anthracycline antibiotics and the method of their preparation. 4,351,937, Cl. 536-6.400.
Stefanski, Eugene J.: *See*—
Rule, Charles E.; Gilmore, Cecilia; and Stefanski, Eugene J., 4,351,852, Cl. 426-554.000.
Steinberger, Helmut; Moretto, Hans-Heinrich; Kortmann, Wilfried; and Pfeiffer, Josef, to Bayer Aktiengesellschaft. Pile-stabilizing silicon-containing textile agents. 4,351,736, Cl. 252-8.600.
Steiner, Eginhard: *See*—
Martin, Pierre; Steiner, Eginhard; and Bellus, Daniel, 4,351,961, Cl. 568-381.000.
Stenstrom, Lennart: *See*—
Axelsson, Bror; Johnsen, Ulf; Stenstrom, Lennart; and Thors, Bengt, 4,352,140, Cl. 361-127.000.
Stenzler, Alex, to Bio-Med Devices, Inc. Method and apparatus for monitoring lung compliance. 4,351,344, Cl. 128-720.000.
Stephen, James H.; McCann, John D.; and Flemming, Michael A., to Parmeko Limited. Surveillance systems. 4,352,098, Cl. 340-572.000.
Stephenson, Leonard P.; and Schweizer, Arthur A., to Cominco Ltd. Flotation of Cu and Pb sulfide concentrates containing carbonates. 4,351,668, Cl. 75-2.000.
Sterling Drug Inc.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,351,768, Cl. 260-326.13R.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,351,941, Cl. 546-258.000.
Oesterlin, Rudolf, 4,351,944, Cl. 546-329.000.
Sternberg, Kurt, to Vorwerk & Co. Interholding GmbH. Driving arrangements for floor maintenance machines. 4,351,078, Cl. 15-49.00C.
Stetler, Harold O. Simulated rain on a window pane panel assembly. 4,352,149, Cl. 362-96.000.
Steuer, Werner; and Leiter, Bernd, to Fichtel & Sachs AG. Hub sleeve formed of deep-drawn parts. 4,351,569, Cl. 301-6.00V.
Stevens, Aaron A.: *See*—
Lawrence, Randall K.; and Stevens, Aaron A., 4,351,424, Cl. 192-18.00R.
Stevens, Timothy S., to Dow Chemical Co., The; and Dionex Corporation. High performance ion-exchange composition. 4,351,909, Cl. 521-28.000.
Stevenson, Robert K.: *See*—
Schultz, Edward C.; and Stevenson, Robert K., 4,351,529, Cl. 273-75.000.
Stewart-Warner Corporation: *See*—
Fontana, Frank J., 4,351,084, Cl. 16-45.000.
Stievenart, Emile. Suction-operated device for feeding sheets one by one to a point of utilization. 4,351,518, Cl. 271-90.000.
Stinger, Henry J., to Du Pont de Nemours, E. I., and Company. Electrically conductive polyetherester elastomers. 4,351,745, Cl. 252-511.000.
Stipura, Anatoly: *See*—
Rehme, Wilfried; Stipura, Anatoly; Ripnyi, Victor; Donskoi, Leonid; and Schevtschenko, Nikolai, 4,351,190, Cl. 73-638.000.
Stockett, Larry A., to Logicon, Inc. Merchandising terminal. 4,351,591, Cl. 353-25.000.
Stockman, Richard F., to Combustion Engineering, Inc. Heat exchange tube with heat absorptive shield. 4,351,392, Cl. 165-186.000.

Stockman, Robert M., to American Radionic Co., Inc. Multiple element cylindrical metallized film capacitors and method of making the same. 4,352,145, Cl. 361-329.000.

Stoll, Kurt; and Tschacher, Dieter. Abrasive paper connection for use on an oscillating grinder. 4,351,133, Cl. 51-358.000.

Stoll, Kurt. Fluid power driving unit. 4,351,229, Cl. 92-128.000.

Stone, John B.: *See*—
Gorbaty, Martin L.; Stone, John B.; and Poddar, Syamal K., 4,351,716, Cl. 208-8.0LE.

Stone & Webster Engineering Corp.: *See*—
Bhojwani, Arju H.; Gartside, Robert J.; and Woebcke, Herman N., 4,351,275, Cl. 122-7.00R.

Story, Alfred D.: *See*—
Williams, Frank E.; and Story, Alfred D., 4,351,549, Cl. 285-27.000.

Strand, Timothy C.: *See*—
Chavel, Pierre H.; Sawchuk, Alexander A.; Soffer, Bernard H.; Strand, Timothy C.; and Tanguay, Armand R., Jr., 4,351,589, Cl. 350-342.000.

Street, Sidney W.; and Beckley, Don A., to Hitco. Bis-maleimide/divinyl aryl crosslinking agent resin system. 4,351,932, Cl. 526-262.000.

Stretch Devices, Inc.: *See*—
Newman, Don, 4,351,469, Cl. 228-135.000.

Stritt, Helmut; Schmidt, Alfred; and Leible, Erwin, to Brown, Boveri & Cie Aktiengesellschaft. Device for fastening built-in wiring devices. 4,351,620, Cl. 403-13.000.

Stupnik, Vyacheslav D.: *See*—
Gross, Valery N.; Kozhanov, Evgeny V.; Stupnik, Vyacheslav D.; and Valov, Vladimir V., 4,351,799, Cl. 422-63.000.

Styring, Ralph E., Jr., to Atlantic Richfield Company. Two stage carbon dioxide and methane separation. 4,351,655, Cl. 62-28.000.

Suematsu, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the ignition timing of an internal combustion engine. 4,351,297, Cl. 123-421.000.

Suga, Hisashi: *See*—
Matsumoto, Kimiichiro; Miyake, Hajimu; and Suga, Hisashi, 4,351,846, Cl. 424-305.000.

Sugaya, Kazuyoshi: *See*—
Isogai, Kiyoshi; and Sugaya, Kazuyoshi, 4,351,305, Cl. 123-590.000.

Sugibuchi, Kazuo: *See*—
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Minagawa, Motonubu, 4,351,915, Cl. 524-103.000.

Sugihara, Mikio: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,351,765, Cl. 260-163.000.

Sugisawa, Masaki. Parcel trim attachment construction. 4,351,559, Cl. 296-195.000.

Sugitani, Hatuo; Kudo, Takeo; Mukoyama, Yoshiyuki; and Kawai, Hiromasa, to Hitachi Chemical Company, Ltd. Expandable styrene series resin composition and process for production thereof. 4,351,910, Cl. 521-56.000.

Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,351,482, Cl. 239-703.000.

Suh, Nam P.; Senturia, Stephen D.; and Kim, Byung H., to Massachusetts Institute of Technology. Determination of moisture level in materials. 4,352,059, Cl. 324-61.00R.

Sumitomo Chemical Company, Limited: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,351,765, Cl. 260-163.000.

Summerfield, James D., to General Motors Corporation. Groove structure for a retaining ring. 4,351,450, Cl. 220-319.000.

Summers, Kenneth L., to Rieke Corporation. Child-resistant safety closure. 4,351,442, Cl. 215-216.000.

Summers, Robert F. Engine. 4,351,202, Cl. 74-604.000.

Sun Chemical Corporation: *See*—
Skrypek, John P.; Williams, Robert; and Sirvet, Enn, 4,351,610, Cl. 355-86.000.

Sun, Kwok K., to Upjohn Company, The. Process for preparing diaminodiphenyl-alkanes. 4,351,957, Cl. 564-331.000.

Sundberg, Erik G., to Koehler Manufacturing Company. Tubular bodies for use in a positive plate of a lead-acid storage battery. 4,351,889, Cl. 429-141.000.

Sundstrand Corporation: *See*—
Reynolds, Richard W.; Myers, Allen; and Foley, Daniel J., 4,351,152, Cl. 60-395.000.

Suska, Charles R., to Stanley Works, The. Non-handed two knuckle hinge. 4,351,085, Cl. 16-273.000.

Suttles, James M., to Mead Corporation, The. Shelving system. 4,351,244, Cl. 108-107.000.

Suzuki, Hideo; and Kaneko, Makoto, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with performance mode selection. 4,351,214, Cl. 84-1.030.

Suzuki, Mitsuo: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Suzuki, Toshikazu: *See*—
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,351,482, Cl. 239-703.000.

Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Camera. 4,351,598, Cl. 354-288.000.

Suzuki, Toyotosi; Matsuda, Mutsuhide; and Tamamura, Hideo, to Canon Kabushiki Kaisha. Camera. 4,351,599, Cl. 354-288.000.

Swadling, Sidney J.; Mansbridge, Martin H.; Payne, Dennis J.; and Norton, John, to British Aerospace Public Limited Company. Method of making a stiffened panel. 4,351,470, Cl. 228-157.000.

Swanson, Roy T.: *See*—
Evans, David M.; and Swanson, Roy T., 4,351,994, Cl. 200-153.0SC.

Sybron Corporation: *See*—
Rosenfeldt, Wolfgang, 4,351,634, Cl. 433-28.000.

Syva Company: *See*—
Khanna, Pyare; and Ullman, Edwin F., 4,351,760, Cl. 260-112.00R.

Szentkiralyi, Laszlo: *See*—
Farkas, Peter E., 4,351,145, Cl. 56-400.160.

Tagawa, Kazuaki, to Ricoh Company, Ltd. Electronic copying apparatus. 4,351,603, Cl. 355-3.0CH.

Taiheiyo Engineering Inc.: *See*—
Takahashi, Ken; and Ito, Tsunetoshi, 4,351,565, Cl. 299-1.000.

Taiho Kogyo Kabushiki Kaisha: *See*—
Ichikawa, Shigeo; Ito, Motonobu; and Aiba, Makoto, 4,351,175, Cl. 72-203.000.

Taj, Hatim H.: *See*—
Du Pont, John P.; Taj, Hatim H.; Schoenwetter, Randall R.; Vanlankvelt, Theodore J.; Kwiatkowski, Robert E.; and Lange, Richard W., 4,352,139, Cl. 361-117.000.

Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, to Victor Company of Japan, Ltd. Disc-shaped recording medium reproducing apparatus. 4,352,174, Cl. 369-77.000.

Takagi, Hiromitsu; Umebachi, Shotaro; Kano, Gota; and Teramoto, Iwao, to Matsushita Electronics Corporation. Method of making FET utilizing shadow masking and diffusion from a doped oxide. 4,351,099, Cl. 29-571.000.

Takahashi, Hironobu; Honda, Masamitus; Murakami, Yasushi; and Iwane, Yoshitaka, to Chugai Seiyaku Kabushiki Kaisha. Pesticide. 4,351,834, Cl. 424-249.000.

Takahashi, Ken; and Ito, Tsunetoshi, to Taiheiyo Engineering Inc. Roof sensing control of shearer in longwall mining. 4,351,565, Cl. 299-1.000.

Takahashi, Masao; Yoshida, Katumi; Ohwaki, Shinji; and Moriga, Hiroyuki, to Teijin Limited. Yarn treating composition for high-speed friction draw-false twist texturing and a filamentary yarn treated with the same. 4,351,738, Cl. 252-8.750.

Takahashi, Sankichi: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,351,715, Cl. 204-301.000.

Takahata, Kazunori; and Taniguchi, Katsuo, to Mitsui Petrochemical Industries, Ltd. Process for producing orthoalkylated aromatic amine. 4,351,958, Cl. 564-409.000.

Takami, Katsumi: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.

Takata, Hisao: *See*—
Kimura, Takao; Sakaguchi, Shigeki; and Takata, Hisao, 4,351,657, Cl. 65-3.110.

Takeda, Masashi: *See*—
Miyake, Masayuki; Sekino, Takeo; and Takeda, Masashi, 4,352,027, Cl. 307-221.00R.

Takenaka, Hidenori: *See*—
Ariga, Nagao; Shimazu, Kyotaro; Takenaka, Hidenori; and Sato, Hiroyuki, 4,351,920, Cl. 525-67.000.

Takeuchi, Mikio: *See*—
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Tamamura, Hideo: *See*—
Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,351,598, Cl. 354-288.000.
Suzuki, Toyotosi; Matsuda, Mutsuhide; and Tamamura, Hideo, 4,351,599, Cl. 354-288.000.

Tamura, Masao: *See*—
Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, 4,351,674, Cl. 148-1.500.

Tamura, Masuhiko: *See*—
Nakamura, Seishiro; and Tamura, Masuhiko, 4,351,964, Cl. 568-484.000.

Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, to National Institute of Radiological Sciences; and Hitachi Medical Corporation. Apparatus for performing positron emission computed tomography. 4,352,018, Cl. 250-363.00S.

Tanaka, Seiji: *See*—
Kondo, Shigeki; Iketani, Tomofumi; Yamazaki, Yoshio; Doi, Keiichiro; and Tanaka, Seiji, 4,351,996, Cl. 219-10.49R.

Tanaka, Shigeru, to Musashi Co., Ltd. Stacker apparatus for a card counting machine. 4,351,520, Cl. 271-315.000.

Tanguay, Armand R., Jr.: *See*—
Chavel, Pierre H.; Sawchuk, Alexander A.; Soffer, Bernard H.; Strand, Timothy C.; and Tanguay, Armand R., Jr., 4,351,589, Cl. 350-342.000.

Taniguchi, Katsuo: *See*—
Takahata, Kazunori; and Taniguchi, Katsuo, 4,351,958, Cl. 564-409.000.

Taniguchi, Kazuhiro: *See*—
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,351,266, Cl. 118-425.000.

Tanis, Georges: *See*—
Gervais, Yvon; Gillet, Renen; and Tanis, Georges, 4,352,004, Cl. 219-121.0ED.

Tappert, Hans-Jurgen; Schulz, Horst; Johne, Hans; and Johne, Albrecht, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for printing-pressure control. 4,351,237, Cl. 101-216.000.

Tarkinson, Ann W.: *See*—
Tarkinson, Kevork W., 4,351,081, Cl. 15-210.00R.

Tarkinson, Kevork W., to Tarkinson, Ann W. Absorbent pad and holder assembly for carpet cleaning. 4,351,081, Cl. 15-210.00R.

Taylor, Allen R., to Singer Company, The. Gyro autophase system. 4,351,194, Cl. 74-5.370.

Taylor, Dorothy L. Panty hose garments. 4,351,068, Cl. 2-409.000.

Taylor, Thomas J.: *See*—
Elliott, William A.; and Taylor, Thomas J., 4,351,689, Cl. 156-378.000.

Taylor, William B., to Leggett & Platt, Incorporated. Merchandise display device. 4,351,439, Cl. 211-49.00D.

Tazaki, Shigemitsu: *See*—
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.

TDK Electronics Co., Ltd.: *See*—
Klagane, Kiyoshi; and Kakizaki, Masao, 4,351,104, Cl. 29-603.000.
Mitsui, Tadashi; Wasaki, Masaru; and Ohta, Junpei, 4,352,080, Cl. 336-83.000.

Te Ka De Felton & Guilleaume Fernmeldeanlagen GmbH: *See*—
Braak, Dirk J., 4,352,110, Cl. 343-844.000.

Teepak, Inc.: *See*—
Williams, Frank E.; and Story, Alfred D., 4,351,549, Cl. 285-27.000.

Teets, J. Michael: *See*—
Wiita, Bruce E.; and Teets, J. Michael, 4,351,342, Cl. 128-349.00B.

Teich, Udo: *See*—
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Teijin Limited: *See*—
Aoyama, Hideki; and Kishida, Takashi, 4,351,492, Cl. 242-18.00R.
Matsumura, Shunichi; Inata, Hiroo; and Morinaga, Tsuto, 4,351,936, Cl. 528-289.000.
Takahashi, Masao; Yoshida, Katumi; Ohwaki, Shinji; and Moriga, Hiroyuki, 4,351,738, Cl. 252-8.750.

Telediffusion de France: *See*—
Reneric, Michel E., 4,352,094, Cl. 340-347.0AD.

Teledyne Industries, Incorporated: *See*—
Starnes, Roger L.; Henson, Ernest D.; Wilkes, Thomas J.; and Sharp, James M., 4,351,221, Cl. 84-1.280.

Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., to Stamicarbon, B.V. Process for selective extraction of metal ions from aqueous solutions and extracting agents suitable for that purpose. 4,351,807, Cl. 423-24.000.

Temple, Victor A. K., to Electric Power Research Institute, Inc. Thyristor with segmented turn-on line for directing turn-on current. 4,352,118, Cl. 357-38.000.

Teramoto, Iwao: *See*—
Takagi, Hiromitsu; Umebachi, Shotaro; Kano, Gota; and Teramoto, Iwao, 4,351,099, Cl. 29-571.000.

Terasawa, Koji: *See*—
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Okamura, Shigeru; Terasawa, Koji; Kasugayama, Yukio; and Hattori, Yoshihumi, 4,352,114, Cl. 346-140.00R.

Terazono, Narihiro; and Kajiyama, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control device. 4,351,416, Cl. 187-29.00R.

Terrien, Donald R.: *See*—
Giggard, Earl D.; Khoury, Nick S.; Kowalik, John J.; and Terrien, Donald R., 4,351,445, Cl. 220-91.000.

Tetirick, Jack E. Solar energy heating panel for a building. 4,351,320, Cl. 126-425.000.

Tetra Pak International AB: *See*—
Carlsson, Lars, 4,351,461, Cl. 226-28.000.

Texaco Inc.: *See*—
Knifton, John F., 4,351,907, Cl. 518-700.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,645, Cl. 48-61.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,351,647, Cl. 48-197.00R.
Owens, William R.; Chan, Henry C.; Abraham, Ooriapadical C.; and Parker, Levi C., 4,351,649, Cl. 55-162.000.
Smolin, William, 4,351,981, Cl. 585-828.000.

Texas Instruments Deutschland GmbH: *See*—
Guth, Friedrich, 4,352,125, Cl. 358-101.000.

Thalenfeld, David R., to Trion Industries Inc. Merchandise hook. 4,351,440, Cl. 211-57.100.

Theuerkauf, Heinz: *See*—
Geiger, Istvan; Theuerkauf, Heinz; and Stamm, Klaus, 4,351,281, Cl. 123-425.000.

Thirion, Pierre, to Oxysynthese. Regeneration of chemical reconversion catalysts used in a cyclic process for the production of hydrogen peroxide and apparatus therefor. 4,351,820, Cl. 423-588.000.

Thomas, Daniel W.: *See*—
Cesark, Frank F.; and Thomas, Daniel W., 4,351,956, Cl. 564-256.000.

Thomas, Paul E.; and Raley, Garland E., to Ethyl Corporation. Corona treatment of perforated film. 4,351,784, Cl. 264-22.000.

Thomas, Richard C.: *See*—
White, David R.; and Thomas, Richard C., 4,351,771, Cl. 549-361.000.

Thomas Steel Strip Corp.: *See*—
Hirt, Theodore A.; and Dillon, Robert H., 4,351,713, Cl. 204-207.000.

Thomson-CSF: *See*—
Dautremay, Alain; and Boljevic, Jean M., 4,352,195, Cl. 375-120.000.
Moutou, Paul C.; and Montel, Jacques, 4,352,115, Cl. 357-13.000.
Perez, Andre; Boljevic, Jean M.; and Dautremay, Alain, 4,352,192, Cl. 375-56.000.

Thors, Bengt: *See*—
Axelsson, Bror; Johnsen, Ulf; Stenstrom, Lennart; and Thors, Bengt, 4,352,140, Cl. 361-127.000.

Thumm, Helmut: *See*—
Schmoller, Karl-Heinz; Bahr, Theodor; Bottger, Ernst; Henrich, Hans-Otto; Thumm, Helmut; and Beck, Heinz, 4,351,486, Cl. 241-67.000.

Tibbles, Tom T.: *See*—
Lemieux, George E.; and Tibbles, Tom T., 4,351,206, Cl. 74-866.000.

Tierney, Raymond J. Manually adjustable valve means for an exhaust gas recirculation system. 4,351,303, Cl. 123-568.000.

Tigner, Thomas E.; and Parker, Charles R. Non-tactile switch. 4,352,046, Cl. 315-362.000.

Tikhonov, Valentin N.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Tillmann, Heinz: *See*—
Kranz, Walter; and Tillmann, Heinz, 4,351,479, Cl. 239-265.230.

Titus, Theodore, IV; and Bagley, Julius B., to Lanier Business Products, Inc. Dictation display device. 4,352,173, Cl. 369-27.000.

Tobita, Katsumi: *See*—
Kato, Masaki; and Tobita, Katsumi, 4,352,205, Cl. 455-183.000.

Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Fluid flow velocity sensor using a piezoelectric element. 4,351,192, Cl. 73-861.180.

Toffolon, Roger L.; and Kart, Warren E., to Doublewal Corporation. Multi-part form with improved tie and stripping means. 4,351,507, Cl. 249-63.000.

Tokas, Edward F., to Monsanto Company. Process for terpolymer polyblends having high gloss and ductility. 4,351,923, Cl. 525-250.000.

Tokuyama, Takashi: *See*—
Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, 4,351,674, Cl. 148-1.500.

Tokyo Electric Power Co., Inc., The: *See*—
Hashimoto, Yuuji; Kobayashi, Izumi; Suzuki, Mitsuo; Yamada, Kimio; Izumi, Shigeru; and Michiguchi, Yoshihiro, 4,352,167, Cl. 367-127.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Masuda, Eiji; and Kawasaki, Hiroshi, 4,352,092, Cl. 340-347.0DA.
Yamada, Yoshihiro, 4,351,602, Cl. 355-3.00R.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,352,157, Cl. 364-200.000.
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,351,894, Cl. 430-313.000.

Tom McGuane Industries, Inc.: *See*—
Ludwig, George C., 4,351,284, Cl. 123-545.000.

Tomalia, Donald A.: *See*—
Chamberlin, Thomas A.; and Tomalia, Donald A., 4,351,933, Cl. 526-266.000.

Tomita, Satoru: *See*—
Ohori, Tamio; Mastumoto, Fuyuhiko; and Tomita, Satoru, 4,352,128, Cl. 358-294.000.

Tomitani, Takehiro: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.

Tommasini, Giuseppe: *See*—
Martinengo, PierCarlo; Giachello, Angelo; Tommasini, Giuseppe; and Popper, Paul, 4,351,787, Cl. 264-65.000.

Torbet, Philip A.: *See*—
Woodring, Cooper C.; and Torbet, Philip A., 4,351,418, Cl. 188-24.220.

Torisawa, Akira: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,352,172, Cl. 368-76.000.

Tosi, Bruno: *See*—
Colombo, Bruno; and Tosi, Bruno, 4,351,193, Cl. 73-864.820.

Tottori Sanyo Electric Co., Ltd.: *See*—
Iwata, Mitsuo; Masuda, Naomasa; Uraki, Hideki; and Tsuchino, Kunio, 4,351,498, Cl. 242-204.000.

Toukan, Sameeh S.; and Hauptschein, Murray, to Pennwalt Corporation. Fluorinated heterocyclic sulfides. 4,351,946, Cl. 548-142.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,351,410, Cl. 180-210.000.

Townsend, Ray T., to Townsend Engineering Company. Self-balancing wheeled vehicle. 4,351,410, Cl. 180-210.000.

Toyama, Masamichi: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Iwama, Hideto; Okajima, Hidekazu; and Nishimura, Akimasa, 4,351,590, Cl. 352-140.000.

Toyo Seikan Kaisha Limited: *See—*
Ishibashi, Kazuhisa; Matsui, Sadaki; Yasumuro, Hisakazu; Imatani, Tsuneo; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,352,001, Cl. 219-64.000.
Toyoda Gosei Co., Ltd.: *See—*
Otani, Takashi, 4,351,868, Cl. 428-120.000.
Toyoda, Minoru, to Aisin Seiki Kabushiki Kaisha. Key holder. 4,351,173, Cl. 70-456.00R.
Toyokuni, Kazuo: *See—*
Yoshida, Jituo; and Toyokuni, Kazuo, 4,351,196, Cl. 74-15.400.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Igarashi, Isao, 4,351,404, Cl. 180-14.00R.
Kanou, Noboru; and Mori, Keiji, 4,351,560, Cl. 296-216.000.
Kayanuma, Nobuaki, 4,351,296, Cl. 123-328.000.
Suematsu, Toshio, 4,351,297, Cl. 123-421.000.
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,351,482, Cl. 239-703.000.
Yoshida, Akio, 4,351,515, Cl. 267-8.00R.
Toyota Jodosha Kogyo Kabushiki Kaisha: *See—*
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tpT Machinery Corporation: *See—*
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Trakhtenberg, Lev I.: *See—*
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Transamerica DeLaval, Inc.: *See—*
Allen, Walter E., 4,351,301, Cl. 123-557.000.
Ogle, Francis H., Jr., 4,351,358, Cl. 137-512.100.
Tranter, Inc.: *See—*
Ryan, Jerry E.; and Grove, Edward E., 4,351,277, Cl. 122-390.000.
Trbovich, Nick G.: *See—*
Miller, William J.; and Trbovich, Nick G., 4,351,982, Cl. 178-22.110.
Trianco Redfyre Limited: *See—*
Babbage, Thomas A., 4,351,315, Cl. 126-73.000.
Trion Industries Inc.: *See—*
Thalenfeld, David R., 4,351,440, Cl. 211-57.100.
Triquet, Christian: *See—*
Andrien, Yves; and Triquet, Christian, 4,351,678, Cl. 148-6.310.
Triumph-Adler A.G.: *See—*
Link, Manfred, 4,351,201, Cl. 74-598.000.
Trojan, Willi: *See—*
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Troyen, Harry D. System for generation of electrical power. 4,352,025, Cl. 290-54.000.
Tschacher, Dieter: *See—*
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Tsou, Sander H. C.: *See—*
Carlson, David J.; and Tsou, Sander H. C., 4,352,111, Cl. 343-860.000.
Tsuchino, Kunio: *See—*
Iwata, Mitsuo; Masuda, Naomasa; Uraki, Hideki; and Tsuchino, Kunio, 4,351,498, Cl. 242-204.000.
Tsuchiya, Yutaka, to Hamamatsu TV Co., Ltd. Method and apparatus for analyzing streak image of light pulse formed on electro-optical streaking image tube. 4,352,127, Cl. 358-217.000.
Tsui, Yaiman, to China National Light Industrial Products Import Export Corporation, Shantung Branch. Sequential locking two key lock. 4,351,171, Cl. 70-339.000.
Tsukada, Toshihisa: *See—*
Matsui, Makoto; Shiraki, Yasuhiro; Katayama, Yoshifumi; Tsukada, Toshihisa; and Maruyama, Eiichi, 4,351,856, Cl. 427-38.000.
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Tsukamoto, Masahide: *See—*
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Tsunoda, Masakazu, to Nissan Motor Company, Limited. Voice warning system for an automotive vehicle. 4,352,088, Cl. 340-52.00F.
Tsunoda, Masakazu: *See—*
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Tsushima, Shuichi: *See—*
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Tuchiya, Yoshimasa; Ishii, Katsumi; Iidaka, Toshiharu; and Fujita, Masao, to Nissan Motor Co., Ltd.; and Kokusan Kinzoku Kogyo Kabushiki Kaisha. Locking device for an openable automobile roof. 4,351,561, Cl. 296-216.000.
Turro, Nicholas J., to Alpine Kinetics, Inc. Methods employing magnetic isotope effect. 4,351,707, Cl. 204-158.00R.
Tuson, Samuel; and Vilain, Robert, to Entreprise d'Equipements Mecaniques et Hydrauliques, E.M.H. Arrangement for mooring a floating body such as a ship. 4,351,260, Cl. 114-230.000.
Twitchell, Brent L.; Twitchell, Kendel S.; and Zitting, Brent W. Movable seat for a motorized transport chair. 4,351,562, Cl. 297-345.000.
Twitchell, Kendel S.: *See—*
Twitchell, Brent L.; Twitchell, Kendel S.; and Zitting, Brent W., 4,351,562, Cl. 297-345.000.
Tymon, Thomas M., to Armstrong World Industries, Inc. Continuous dyeing of pile fabrics. 4,351,641, Cl. 8-638.000.
Tyree, Charles N., to Fike Metal Products Corp. Nozzle having deflector for pressurized fire suppression fluid. 4,351,393, Cl. 169-37.000.
Tzikas, Athanassios, to Ciba-Geigy AG. Process for preparing chlorinated compounds. 4,351,975, Cl. 570-209.000.
Uchidoi, Masanori: *See—*
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; and Watanabe, Yoshiaki, 4,351,597, Cl. 354-266.000.
Ueda, Atsushi: *See—*
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Ueda, Hirohisa: *See—*
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Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, to Kabushiki Kaisha Daini Seikosha. Detection device of electronic timepiece. 4,352,172, Cl. 368-76.000.
Ueda, Teruo: *See—*
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Uehara, Katuharu; and Ochiai, Izumi, to Hitachi, Ltd. Apparatus for bending a straight tube into a serpentine tube. 4,351,178, Cl. 72-383.000.
Ueno, Hiroshi: *See—*
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Uhlig, Gerhardt E. Dual liquid tight closures. 4,351,443, Cl. 215-216.000.
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Umebachi, Shotaro: *See—*
Takagi, Hiromitsu; Umebachi, Shotaro; Kano, Gota; and Teramoto, Iwao, 4,351,099, Cl. 29-571.000.
Un, Chong K. Hybrid companding delta modulation system. 4,352,191, Cl. 375-30.000.
Unglaube, Uwe; and Miehe, Friedrich V., to Nixdorf Computer AG. Device for providing a modulo-n check character. 4,352,096, Cl. 340-815.060.
Union Carbide Corporation: *See—*
Ballintyn, Nicolaas J.; and Michno, Michael J., Jr., 4,351,069, Cl. 3-1.912.
Frost, Albert C.; and Yang, Chang-lee, 4,351,646, Cl. 48-197.00R.
Keogh, Michael J., 4,351,926, Cl. 525-370.000.
Koerwer, John F., 4,351,666, Cl. 71-106.000.
Schulz, David A., 4,351,816, Cl. 423-447.400.
Uniphase Corporation: *See—*
Crane, Dale E., 4,352,185, Cl. 372-29.000.
United Air Specialists, Inc.: *See—*
Penney, Gaylord W., 4,351,648, Cl. 55-137.000.
United Kingdom Atomic Energy Authority: *See—*
Davies, Michael J., 4,351,095, Cl. 29-25.120.
United Kingdom of Great Britain and Northern Ireland, The Minister for Transport in Her Britannic Majesty's Government of the: *See—*
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U.S. Industries, Inc.: *See—*
Holland, Eddie L.; Stallings, Charles K.; and Parker, Jack, 4,351,273, Cl. 119-51.00R.
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Agriculture: *See—*
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Ward, Truman L.; and Benerito, Ruth R., 4,351,857, Cl. 427-40.000.
Air Force: *See—*
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Army: *See—*
Hagood, Jerry W.; and Norman, Ralph L., 4,352,039, Cl. 310-328.000.
Schmidt, Edward M., 4,351,223, Cl. 89-14.00R.
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Martinez, Richard I.; and Herron, John T., 4,351,810, Cl. 423-235.000.
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National Aeronautics & Space Administration: *See—*
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McCubbin, Melvin J.; Johnson, Clifford T.; and Cordle, Paul E., 4,351,240, Cl. 102-364.000.
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Vosika, Albert F. Log splitting blasting wedge and anchor system. 4,351,376, Cl. 144-193.00G.
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Voyer, Joseph L., to NCR Corporation. Regulated converter with volt-balancing control circuit. 4,352,153, Cl. 363-56.000.
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Yamada, Shigeru; and Ichikawa, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of digital processing type. 4,351,220, Cl. 84-1.240.

Yamada, Takashi: *See*—
Shirasaki, Shinji; Yamada, Takashi; and Shimamoto, Mamoru, 4,351,287, Cl. 123-609.000.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; and Yamada, Takashi, 4,351,282, Cl. 123-425.000.

Yamada, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic printer. 4,351,602, Cl. 355-3.00R.

Yamada, Yujiro: *See*—
Miyazawa, Takeo; Ishii, Takahiro; Kazuno, Yuzo; Akita, Eiichi; Yamada, Yujiro; and Niida, Taro, 4,351,830, Cl. 424-180.000.

Yamamoto, Hiroshi: *See*—
Nishimura, Tadahiko; Yamamoto, Hiroshi; Osuo, Masatoshi; and Kanazawa, Akio, 4,351,967, Cl. 568-754.000.

Yamamoto, Kenji: *See*—
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,351,266, Cl. 118-425.000.

Yamamoto, Mikio: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Yamamoto, Mikio; Ishimatsu, Kenji; and Takami, Katsumi, 4,352,018, Cl. 250-363.00S.

Yamamoto, Susumu: *See*—
Saitoh, Takeshi; Hatashita, Hiroshi; Nagashima, Toshio; and Yamamoto, Susumu, 4,352,076, Cl. 333-204.000.

Yamamoto, Takaji: *See*—
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,351,879, Cl. 428-374.000.

Yamamoto, Toshihiro: *See*—
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,351,879, Cl. 428-374.000.

Yamamura, Takashi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,352,174, Cl. 369-77.000.

Yamamuro, Isao; and Tsukagoshi, Tsunehiro, to Pioneer Electronic Corporation. Diaphragm for acoustic instruments and method of manufacturing the same. 4,351,412, Cl. 181-170.000.

Yamasaki, Koji, to Nippon Electric Co. Radio pager having optional annunciating means. 4,352,091, Cl. 340-311.100.

Yamazaki, Yoshio: *See*—
Kondo, Shigeki; Iketani, Tomofumi; Yamazaki, Yoshio; Doi, Keiichiro; and Tanaka, Seiji, 4,351,996, Cl. 219-10.49R.

Yan, Tsoung-yuan; and Espenscheid, Wilton F., to Mobil Oil Corporation. Method and apparatus for mixing gaseous oxidant and lixiviant in an in situ leach operation. 4,351,566, Cl. 299-5.000.

Yanagawa, Hitoshi: *See*—
Inoue, Shunzo; Nagasawa, Takeshi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,351,609, Cl. 355-50.000.

Yanagita, Takanori: *See*—
Shindome, Mamoru; Yanagita, Takanori; Nakamura, Takanori; and Otsuji, Hiroyuki, 4,351,252, Cl. 110-346.000.

Yanaka, Shigenobu: *See*—
Horiba, Isao; Yanaka, Shigenobu; Kuwabara, Yasuo; and Koike, Kouichi, 4,352,020, Cl. 378-18.000.

Yang, Chang-lee: *See*—
Frost, Albert C.; and Yang, Chang-lee, 4,351,646, Cl. 48-197.00R.

Yang, Eugene L.: *See*—
Carpenter, Vance J.; and Yang, Eugene L., 4,351,605, Cl. 355-8.000.

Yannoni, Costantino S.: *See*—
Kendrick, Raymond D.; Wind, Robert A.; and Yannoni, Costantino S., 4,352,066, Cl. 324-321.000.

Yano, Hiroshi; and Tsunoda, Masakazu, to Nissan Motor Company Limited. Voice warning system for an automotive vehicle. 4,352,089, Cl. 340-52.00F.

Yariv, Amnon; Margalit, Shlomo; and Lee, Chien-Ping, to California Institute of Technology. Solid state electro-optical devices on a semi-insulating substrate. 4,352,116, Cl. 357-17.000.

Yasumuro, Hisakazu: *See*—
Ishibashi, Kazuhisa; Matsui, Sadaki; Yasumuro, Hisakazu; Imatani, Tsuneo; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,352,001, Cl. 219-64.000.

Yee, Clifford S. L., to Wallace Murray Corp. Apparatus for engine cooling and vehicle air conditioning. 4,351,162, Cl. 62-239.000.

Yen, Shiao-Ping S.: *See*—
Harper-Tervet, Jan; Dowler, Warren L.; Yen, Shiao-Ping S.; and Mueller, William A., 4,351,878, Cl. 428-367.000.

Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing a semiconductor device using silicon carbide mask. 4,351,894, Cl. 430-313.000.

Yorozu, Arthur S.: *See*—
Peash, Douglas E.; and Yorozu, Arthur S., 4,351,501, Cl. 244-129.100.

Yoshida, Akio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Feedback control type shock absorbing suspension system. 4,351,515, Cl. 267-8.00R.

Yoshida, goichi; Hayano, Fusakazu; and Ii, Yoshiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyaryl ether sulfone semipermeable membrane and process for producing same. 4,351,860, Cl. 427-246.000.

Yoshida, Isao; Wada, Yasuo; Tamura, Masao; Miyao, Masanobu; Ohkura, Makoto; Natsuaki, Nobuyoshi; and Tokuyama, Takashi, to Hitachi, Ltd. Method of producing a semiconductor device. 4,351,674, Cl. 148-1.500.

Yoshida, Jituo; and Toyokuni, Kazuo, to Kubota, Ltd. Multistage change-speed apparatus for a tractor. 4,351,196, Cl. 74-15.400.

Yoshida, Katumi: *See*—
Takahashi, Masao; Yoshida, Katumi; Ohwaki, Shinji; and Moriga, Hiroyuki, 4,351,738, Cl. 252-8.750.

Yoshida, Kenji: *See*—
Kanemaru, Muneaki; Yoshida, Kenji; Higashino, Thikashi; and Kozima, Tadashi, 4,351,971, Cl. 568-898.000.

Yoshida, Noboru: *See*—
Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, 4,351,976, Cl. 570-262.000.

Yoshida, Tooru; Iwagami, Seigo; Ueshima, Takashi; and Hosoda, Yoshikazu, to Showa Denko Kabushiki Kaisha. Process for the production of highly water-absorbing but less water-soluble hydrogels. 4,351,922, Cl. 525-116.000.

Yoshihara, Ichiro: *See*—
Mizuta, Toshiaki; Abe, Takeshi; Yoshihara, Ichiro; and Saito, Kazuhito, 4,352,104, Cl. 340-825.150.

Yost, Kenneth M.: *See*—
Maudal, Inge; Wedertz, Larry D.; and Yost, Kenneth M., 4,351,499, Cl. 244-3.270.

Young, Alastair J., to Automotive Products Limited. Vehicle brake pressure proportioning valves. 4,351,570, Cl. 303-24.00F.

Young, Miriam F., to Honeywell Inc. Semiconductor device processing for readily and reliably forming electrical interconnects to contact pads. 4,351,101, Cl. 29-577.00C.

Young, Robert E.; and Huffman, Richard K., to Northern Telecom, Inc. Apparatus for use in a telephone exchange including an operator cordboard position. 4,351,984, Cl. 179-7.10R.

Yu, Jing-peir: *See*—
Blackmon, Lawrence E.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,351,147, Cl. 57-208.000.

Yuen, Se-kit, to John Manufacturing Limited. Telephone index. 4,351,125, Cl. 40-381.000.

Zacherl, Anton, to MTU Motoren-und Turbinen-Union Munchen GmbH. Wire ring bearing. 4,351,577, Cl. 308-189.00R.

Zahniser, James A.: *See*—
Psaras, John D.; and Zahniser, James A., 4,351,732, Cl. 210-689.000.

Zahnradfabrik Friedrichshafen: *See*—
Fischer, Gunter, 4,351,205, Cl. 74-866.000.

Zanzucchi, Peter J.: *See*—
Duffy, Michael T.; and Zanzucchi, Peter J., 4,352,016, Cl. 250-358.100.
Duffy, Michael T.; Corboy, John F., Jr.; and Zanzucchi, Peter J., 4,352,017, Cl. 250-358.100.

Zega, Bogdan, to Societa Italiana Vetro-SIV-S.p.A. Heated mirror, designed in particular to constitute an external rearview mirror element for a vehicle. 4,351,006, Cl. 219-219.000.

Zeigler, Andy W. Method and apparatus for forming ice sculptures or the like. 4,351,157, Cl. 62-1.000.

Zeller, Rudolf: *See*—
Ortner, Artur; and Zeller, Rudolf, 4,351,633, Cl. 432-77.000.

Zellner, Wilhelm: *See*—
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; and Schlaich, Jorg, 4,352,112, Cl. 343-915.000.

Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, to Farmitalia Carlo Erba Spa. Use of polypeptides as analgesic drugs. 4,351,829, Cl. 424-177.000.

Zhestkov, Vitaly I.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Zhigalov, Gennady V.: *See*—
Abduganiev, Abdurakhim; Krjuk, Timur P.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Glazov, Vladimir G.; Kletny, Mikhail M.; Shlykov, Gennady N.; Afanasiev, Vladimir K.; Dyachkov, Vasily M.; Zhigalov, Gennady V.; Mangutov, Rafael A.; and Angarov, Ernst I., 4,351,149, Cl. 57-263.000.

Zhukov, Mikhail F.; Lytkin, Albert Y.; Khudyakov, Georgy N.; and Anshakov, Anatoly S. Plasma generator. 4,352,044, Cl. 315-111.210.

Ziemek, Gerhard: *See*—
Bauermeister, Klaus; Ziemek, Gerhard; and Eilhardt, Bernd, 4,351,365, Cl. 138-149.000.

Zimmer Manufacturing Corp.: *See*—
McKindary, Thomas W., 4,351,210, Cl. 83-835.000.

Zirps, Wilhelm, to Robert Bosch GmbH. Electric motor operated adjusting drive. 4,352,035, Cl. 310-80.000.

Zitting, Brent W.: *See*—
Twitchell, Brent L.; Twitchell, Kendel S.; and Zitting, Brent W., 4,351,562, Cl. 297-345.000.

Zobel, Don W.: *See*—
Cave, David L.; Harris, Steven L.; and Zobel, Don W., 4,352,056, Cl. 323-314.000.

Zobel, Dwight D. Self-locking, unlocking detachable hand lever cam sealed container. 4,351,449, Cl. 220-318.000.

Zukowski, Edward A.: *See*—
Depweg, Frank A.; and Zukowski, Edward A., 4,351,096, Cl. 29-38.00A.

Zullig, Harry T., to Relium AG. Process and means for controlling the radiant energies of the entire spectral range in rooms. 4,351,588, Cl. 350-259.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Carbone, Victor T.: *See*—
Clark, Stephen C.; and Carbone, Victor T., Re. 31,042, Cl. 219-121.0LG.

Clark, Stephen C.; and Carbone, Victor T., to Houdaille Industries, Inc. Laser cutting head attachment for punch presses. Re. 31,042, Cl. 219-121.0LG.

Du Pont de Nemours, E. I., and Company: *See*—
McKinney, Charles R., Re. 31,043, Cl. 250-283.000.

Houdaille Industries, Inc.: *See*—
Clark, Stephen C.; and Carbone, Victor T., Re. 31,042, Cl. 219-121.0LG.

McKinney, Charles R., to Du Pont de Nemours, E. I., and Company. Mass spectrometer beam monitor. Re. 31,043, Cl. 250-283.000.

McReynolds, Marshall B.; Oscar, Irving S.; and Van Tilbury, Jack, to TRAC, Inc. Traffic coordinator for arterial traffic system. Re. 31,044, Cl. 364-437.000.

Oscar, Irving S.: *See*—
McReynolds, Marshall B.; Oscar, Irving S.; and Van Tilbury, Jack, Re. 31,044, Cl. 364-437.000.

Otto Zollinger, Inc.: *See*—
Zollinger, Otto, Re. 31,041, Cl. 242-152.100.

Possis, Zinon C., to St. Jude Medical, Inc. Heart valve prosthesis. Re. 31,040, Cl. 3-1.500.

St. Jude Medical, Inc.: *See*—
Possis, Zinon C., Re. 31,040, Cl. 3-1.500.

TRAC, Inc.: *See*—
McReynolds, Marshall B.; Oscar, Irving S.; and Van Tilbury, Jack, Re. 31,044, Cl. 364-437.000.

Van Tilbury, Jack: *See*—
McReynolds, Marshall B.; Oscar, Irving S.; and Van Tilbury, Jack, Re. 31,044, Cl. 364-437.000.

Zollinger, Otto, to Otto Zollinger, Inc. Yarn tensioning device. Re. 31,041, Cl. 242-152.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Runyon, Robert C., to Chemet Research, Inc. Flexible, self-supporting blade for cutting electronic crystals and substrates or the like. B1 4,219,004, Cl. 125–15.

Chemet Research, Inc.: *See*—
Runyon, Robert C. B1 4,219,004, Cl. 125–15.

Raybould, Delmar H. Conveyor chain. B1 3,160,264. Cl. 198–851.

LIST OF DESIGN PATENTEES

A/S Tasso Odense: *See*—
Rasmussen, Henning, 266,352, Cl. D23-90.000.
Rasmussen, Henning, 266,353, Cl. D23-90.000.
Rasmussen, Henning, 266,354, Cl. D23-90.000.

Abbott Laboratories: *See*—
Kerns, Ralph M., 266,358, Cl. D24-56.000.

Acme Steel Door Corp.: *See*—
Siegal, Burton L., 266,359, Cl. D25-74.000.

Advertising Displays Company: *See*—
Zaro, Marvin, 266,297, Cl. D6-199.000.

AGFA-Gevaert AG: *See*—
Schultes, Herbert; and Rubner, Karl-Heinz, 266,330, Cl. D16-1.000.
Schultes, Herbert; and Rubner, Karl-Heinz, 266,331, Cl. D16-6.000.
Schultes, Herbert; and Rubner, Karl-Heinz, 266,332, Cl. D16-8.000.

American Commercial, Incorporated: *See*—
Everhan, Walter, 266,304, Cl. D7-66.000.

Ansel, Pierre, to SEB. Meat grill. 266,306, 9-28-82, Cl. D7-88.000.

Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Vending machine. 266,337, 9-28-82, Cl. D20-5.000.

Bates Manufacturing Company, The: *See*—
Leib, William S., III, 266,336, Cl. D19-76.000.

Bergquist, Gregory D.; and Jones, John A., to Simmons Universal Corporation. Table. 266,296, 9-28-82, Cl. D6-175.000.

Bigham, George F.; and Johnston, Rodney B. Golfing wrist control attachment or the like. 266,345, 9-28-82, Cl. D21-234.000.

Blissett, Malcolm G.; Bowen, Arthur W.; and Lucarelli, James H., to Goodyear Tire & Rubber Company, The. Shoe sole. 266,287, 9-28-82, Cl. D2-320.000.

Bowen, Arthur W.: *See*—
Blissett, Malcolm G.; Bowen, Arthur W.; and Lucarelli, James H., 266,287, Cl. D2-320.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy helicopter rig. 266,341, 9-28-82, Cl. D21-134.000.

Butchko, Joseph J. Telephone console. 266,325, 9-28-82, Cl. D14-63.000.

Chau, Ho Sing, to H & T Electronic Industries Ltd. Combined writing instrument and watch. 266,335, 9-28-82, Cl. D19-36.000.

Clarion Co., Ltd.: *See*—
Kikuhara, Toshiyoshi, 266,326, Cl. D14-96.000.

Clarks Limited: *See*—
Haring, Noel J.; and Snook, Laurence A., 266,314, Cl. D10-70.000.

Coca-Cola Company, The: *See*—
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 266,337, Cl. D20-5.000.

Coelho dos Santos, Jose. Building block. 266,360, 9-28-82, Cl. D25-80.000.

Coelho dos Santos, Jose. Building block. 266,361, 9-28-82, Cl. D25-80.000.

Coelho dos Santos, Jose. Building block. 266,362, 9-28-82, Cl. D25-80.000.

Coelho dos Santos, Jose. Building block. 266,363, 9-28-82, Cl. D25-80.000.

Coelho dos Santos, Jose. Building block. 266,364, 9-28-82, Cl. D25-80.000.

Coon, Richard H. Bowling glove. 266,288, 9-28-82, Cl. D2-361.000.

Corigliano, Mary. Contemporary rosary. 266,369, 9-28-82, Cl. D99-26.000.

Cornacchuila, Frank: *See*—
Fidler, Jay W.; and Cornacchuila, Frank, 266,310, Cl. D9-392.000.

Corning Glass Works: *See*—
Gerow, Cynthia S., 266,303, Cl. D7-39.000.
Haner, Richard V., 266,300, Cl. D7-17.000.
Moskal, Loretta H., 266,298, Cl. D7-9.000.
Moskal, Loretta H., 266,302, Cl. D7-26.000.
Rosenbaum, Robert A., 266,365, Cl. D26-22.000.

Dantzer, James I.: *See—*
Schneider, Robert W.; Gilly, Alfred S.; Diamant, John R.; and Dantzer, James I., 266,351, Cl. D23-40.000.

Davis, Charles L.: *See—*
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 266,337, Cl. D20-5.000.

Diamant, John R.: *See—*
Schneider, Robert W.; Gilly, Alfred S.; Diamant, John R.; and Dantzer, James I., 266,351, Cl. D23-40.000.

Dino, William C.; and Johnson, Stephen L. Pill counter. 266,317, 9-28-82, Cl. D10-97.000.

Duclos, Clovis R. Golf driver head. 266,344, 9-28-82, Cl. D21-214.000.

Dunstan, Dennis B. Puzzle. 266,339, 9-28-82, Cl. D21-104.000.

Du Vall, Zell, to TSI Incorporated. Fluid flow measuring head. 266,316, 9-28-82, Cl. D10-96.000.

Easterling, Ted. Master control for television and video recorder system. 266,322, 9-28-82, Cl. D13-12.000.

Emerson Electric Co.: *See—*
Mariol, James F., 266,355, Cl. D23-155.000.

Everhan, Walter, to American Commercial, Incorporated. Cream pitcher. 266,304, 9-28-82, Cl. D7-66.000.

F.I.R. Fabbrica Italiana Rubinetterie S.p.A.: *See—*
Piesco, Nazzareno, 266,348, Cl. D23-28.000.
Piesco, Nazzareno, 266,349, Cl. D23-32.000.
Piesco, Nazzareno, 266,350, Cl. D23-32.000.

Fidler, Jay W.; and Cornacchuila, Frank, to Hercules Chemical Company, Inc. Jar or similar article. 266,310, 9-28-82, Cl. D9-392.000.

Flanders, Dudley K., to Flanders Industries, Inc. Log cart. 266,368, 9-28-82, Cl. D34-26.000.

Flanders Industries, Inc.: *See—*
Flanders, Dudley K., 266,368, Cl. D34-26.000.

Fleshman, Shirley F. Combination support and control for a heat shrink roller. 266,328, 9-28-82, Cl. D15-144.000.

Fratelli Saporiti: *See—*
Radaelli, Ernesto, 266,293, Cl. D6-71.000.

Fulton, Jerrell F. Drafting and measuring tool. 266,313, 9-28-82, Cl. D10-62.000.

Gerow, Cynthia S., to Corning Glass Works. Decorative band for casserole holders or the like. 266,303, 9-28-82, Cl. D7-39.000.

Gilly, Alfred S.: *See—*
Schneider, Robert W.; Gilly, Alfred S.; Diamant, John R.; and Dantzer, James I., 266,351, Cl. D23-40.000.

Goodyear Tire & Rubber Company, The: *See—*
Blissett, Malcolm G.; Bowen, Arthur W.; and Lucarelli, James H., 266,287, Cl. D2-320.000.

Gulf & Western Manufacturing Company: *See—*
Schneider, Robert W.; Gilly, Alfred S.; Diamant, John R.; and Dantzer, James I., 266,351, Cl. D23-40.000.

H & T Electronic Industries Ltd.: *See—*
Chau, Ho Sing, 266,335, Cl. D19-36.000.

Haight, Marvin E.; and Jones, William R., to Micromolder Machinery, Inc. Automatic injection molding machine. 266,327, 9-28-82, Cl. D15-135.000.

Hall, Ardal F. Handyman tray. 266,301, 9-28-82, Cl. D7-19.000.

Haner, Richard V., to Corning Glass Works. Covered sugar bowl or the like. 266,300, 9-28-82, Cl. D7-17.000.

Haring, Noel J.; and Snock, Laurence A., to Clarks Limited. Footgauge. 266,314, 9-28-82, Cl. D10-70.000.

Harper, David S., to Mayer Mill Mining and Trade Company. Welsh miner's lamp. 266,366, 9-28-82, Cl. D26-104.000.

Harper, Ronald D.: *See—*
Millay, George D.; and Harper, Ronald D., 266,346, Cl. D21-244.000.

Hercules Chemical Company, Inc.: *See—*
Fidler, Jay W.; and Cornacchuila, Frank, 266,310, Cl. D9-392.000.

Hilko, Steven E., to Quaker Oats Company, The. Toy dragster. 266,343, 9-28-82, Cl. D21-137.000.

HOH, Inc.: *See—*
O'Halloran, Paul J.; and Morgan, Glen, 266,294, Cl. D6-95.000.

Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.): *See—*
Morioka, Minoru; and Sugihara, Hideki, 266,321, Cl. D12-182.000.

Iijima, Takekazu, to Pioneer Kabushiki Kaisha. Loudspeaker. 266,324, 9-28-82, Cl. D14-30.000.

Johnson, Stephen L.: *See—*
Dino, William C.; and Johnson, Stephen L., 266,317, Cl. D10-97.000.

Johnston, Rodney B.: *See—*
Bigham, George F.; and Johnston, Rodney B., 266,345, Cl. D21-234.000.

Jones, John A.: *See—*
Bergquist, Gregory D.; and Jones, John A., 266,296, Cl. D6-175.000.

Jones, William R.: *See—*
Haight, Marvin E.; and Jones, William R., 266,327, Cl. D15-135.000.

Kampfe, Kenneth E., to Willsie Cap and Gown Company. Collar for tassels. 266,289, 9-28-82, Cl. D2-448.000.

Karamian, Narbik A. Faucet for protecting sterile fluid systems. 266,347, 9-28-82, Cl. D23-03.000.

Kawasaki Steel Corporation: *See—*
Tsujimoto, Eiichi, 266,329, Cl. D15-145.000.

Kerns, Ralph M., to Abbott Laboratories. Sample cup. 266,358, 9-28-82, Cl. D24-56.000.

Kfoury, Elie P. Hover craft. 266,320, 9-28-82, Cl. D12-5.000.

Kikuhara, Toshiyoshi, to Clarion Co., Ltd. Amplifier for automobile. 266,326, 9-28-82, Cl. D14-96.000.

Lam, Yanta H. T., to Meyer Manufacturing Co. Ltd. Cooking pan unit. 266,307, 9-28-82, Cl. D7-94.000.

Lawrence, Frederick J. Combined copying and sorting apparatus. 266,333, 9-28-82, Cl. D16-32.000.

Leffler, Dennis F.; and Truette, Danny M., to Pelton & Crane Company, The. Chair. 266,291, 9-28-82, Cl. D6-30.000.

Leffler, Dennis F.; and Truette, Danny M., to Pelton & Crane Company, The. Stool. 266,292, 9-28-82, Cl. D6-35.000.

Leib, William S., III, to Bates Manufacturing Company, The. Card file. 266,336, 9-28-82, Cl. D19-76.000.

Lin, Ellick. Digital watch ring. 266,312, 9-28-82, Cl. D10-31.000.

Linden, Erkki O., to Oy Fiskars AB. Scissors. 266,308, 9-28-82, Cl D8-57.000.

Linden, Erkki O., to Oy Fiskars AB. Scissors. 266,309, 9-28-82, Cl. D8-57.000.

Lucarelli, James H.: *See—*
Blissett, Malcolm G.; Bowen, Arthur W.; and Lucarelli, James H., 266,287, Cl. D2-320.000.

Mandel, Charles S. Card holder and display device. 266,338, 9-28-82, Cl. D20-43.000.

Marini, Louis G.; and Marini, Thomas O., to Suntemp Industries, Inc. Trash cart. 266,367, 9-28-82, Cl. D34-24.000.

Marini, Thomas O.: *See—*
Marini, Louis G.; and Marini, Thomas O., 266,367, Cl. D34-24.000.

Mariol, James F., to Emerson Electric Co. Air blower. 266,355, 9-28-82, Cl. D23-155.000.

Mattheis, Harley H., to Risdon Corporation. Dispensing cap for liquid containers. 266,311, 9-28-82, Cl. D9-446.000.

Mayer Mill Mining and Trade Company: *See—*
Harper, David S., 266,366, Cl. D26-104.000.

Meyer Manufacturing Co. Ltd.: *See—*
Lam, Yanta H. T., 266,307, Cl. D7-94.000.

Micromolder Machinery, Inc.: *See—*
Haight, Marvin E.; and Jones, William R., 266,327, Cl. D15-135.000.

Millay, George D.; and Harper, Ronald D., to Wet 'N Wild, Inc. Water slide. 266,346, 9-28-82, Cl. D21-244.000.

Morgan, Annis R., Jr.: *See—*
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 266,337, Cl. D20-5.000.

Morgan, Glen: *See—*
O'Halloran, Paul J.; and Morgan, Glen, 266,294, Cl. D6-95.000.

Morioka, Minoru; and Sugihara, Hideki, to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.). Windshield for motorcycle. 266,321, 9-28-82, Cl. D12-182.000.

Moskal, Loretta H., to Corning Glass Works. Cup or the like. 266,298, 9-28-82, Cl. D7-9.000.

Moskal, Loretta H., to Corning Glass Works. Plate or the like. 266,302, 9-28-82, Cl. D7-26.000.

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Orenstein, Henry. Child's chair. 266,290, 9-28-82, Cl. D6-12.000.

Oy Fiskars AB: *See—*
Linden, Erkki O., 266,308, Cl. D8-57.000.
Linden, Erkki O., 266,309, Cl. D8-57.000.

Partridge, David, to Starpoint Electrics Limited. Miniature lampholder. 266,323, 9-28-82, Cl. D13-25.000.

Pelton & Crane Company, The: *See—*
Leffler, Dennis F.; and Truette, Danny M., 266,291, Cl. D6-30.000.
Leffler, Dennis F.; and Truette, Danny M., 266,292, Cl. D6-35.000.

Picheria, Ernest. Badge. 266,319, 9-28-82, Cl. D11-56.000.

Piesco, Nazzareno, to F.I.R. Fabbrica Italiana Rubinetterie S.p.A. Faucet handle. 266,348, 9-28-82, Cl. D23-28.000.

Piesco, Nazzareno, to F.I.R. Fabbrica Italiana Rubinetterie S.p.A. Combined spout and pop-up drain knob. 266,349, 9-28-82, Cl. D23-32.000.

Piesco, Nazzareno, to F.I.R. Fabbrica Italiana Rubinetterie S.p.A. Spout. 266,350, 9-28-82, Cl. D23-32.000.

Pioneer Kabushiki Kaisha: *See—*
Iijima, Takekazu, 266,324, Cl. D14-30.000.

Quaker Oats Company, The: *See—*
Breneman, Jack L., 266,341, Cl. D21-134.000.
Hilko, Steven E., 266,343, Cl. D21-137.000.
Wilkes, Kenneth R., 266,340, Cl. D21-132.000.
Wilkes, Kenneth R., 266,342, Cl. D21-137.000.

Radaelli, Ernesto, to Fratelli Saporiti. Chair. 266,293, 9-28-82, Cl. D6-71.000.

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Rasmussen, Henning, to A/S Tasso Odense. Boiler section. 266,353, 9-28-82, Cl. D23-90.000.

Rasmussen, Henning, to A/S Tasso Odense. Boiler section. 266,354, 9-28-82, Cl. D23-90.000.

Risdon Corporation: *See—*
Mattheis, Harley H., 266,311, Cl. D9-446.000.

Rosenbaum, Robert A., to Corning Glass Works. Candle float or the like. 266,365, 9-28-82, Cl. D26-22.000.

Rubner, Karl-Heinz: *See—*
Schultes, Herbert; and Rubner, Karl-Heinz, 266,330, Cl. D16-1.000.
Schultes, Herbert; and Rubner, Karl-Heinz, 266,331, Cl. D16-6.000.
Schultes, Herbert; and Rubner, Karl-Heinz, 266,332, Cl. D16-8.000.

Scheurer, Stephen M. Beverage container insulator. 266,305, 9-28-82, Cl. D7-77.000.

Schneider, Robert W.; Gilly, Alfred S.; Diamant, John R.; and Dantzer, James I., to Gulf & Western Manufacturing Company. Multidirectional welding outlet. 266,351, 9-28-82, Cl. D23-40.000.
Schultes, Herbert; and Rubner, Karl-Heinz, to AGFA-Gevaert AG. Photographic camera. 266,330, 9-28-82, Cl. D16-1.000.
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Schultes, Herbert; and Rubner, Karl-Heinz, to Agfa-Gevaert AG. Single lens reflex camera. 266,332, 9-28-82, Cl. D16-8.000.
SEB: *See*—
Ansel, Pierre, 266,306, Cl. D7-88.000.
Siegal, Burton L., to Acme Steel Door Corp. Channel member for office space dividing system. 266,359, 9-28-82, Cl. D25-74.000.
Simmons Universal Corporation: *See*—
Bergquist, Gregory D.; and Jones, John A., 266,296, Cl. D6-175.000.
Snook, Laurence A.: *See*—
Haring, Noel J.; and Snook, Laurence A., 266,314, Cl. D10-70.000.
Societe Technisynthese (S.A.R.L.): *See*—
Vermonet, Christian, 266,285, Cl. D2-309.000.
Vermonet, Christian, 266,286, Cl. D2-309.000.
Speers, Stephen M. Computer for blackjack decisions. 266,334, 9-28-82, Cl. D18-10.000.
Starpoint Electrics Limited: *See*—
Partridge, David, 266,323, Cl. D13-25.000.
Sugihara, Hideki: *See*—
Morioka, Minoru; and Sugihara, Hideki, 266,321, Cl. D12-182.000.
Suntemp Industries, Inc.: *See*—
Marini, Louis G.; and Marini, Thomas O., 266,367, Cl. D34-24.000.
Tamm, Ulf S. Hydrometer. 266,315, 9-28-82, Cl. D10-84.000.
Tayclox Industries Pty. Limited: *See*—
Taylor, Andrew V., 266,299, Cl. D7-17.000.
Taylor, Andrew V., to Tayclox Industries Pty. Limited. Food storage container. 266,299, 9-28-82, Cl. D7-17.000.
Truette, Danny M.: *See*—
Leffler, Dennis F.; and Truette, Danny M., 266,291, Cl. D6-30.000.
Leffler, Dennis F.; and Truette, Danny M., 266,292, Cl. D6-35.000.
TSI Incorporated: *See*—
Du Vall, Zell, 266,316, Cl. D10-96.000.
Tsujimoto, Eiichi, to Kawasaki Steel Corporation. Merchandise bagging machine. 266,329, 9-28-82, Cl. D15-145.000.
Vermonet, Christian, to Societe Technisynthese (S.A.R.L.). Shoe. 266,285, 9-28-82, Cl. D2-309.000.
Vermonet, Christian, to Societe Technisynthese (S.A.R.L.). Shoe. 266,286, 9-28-82, Cl. D2-309.000.
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Ward, Bruce K. Blank for a combined vent and baffle. 266,357, 9-28-82, Cl. D23-163.000.
Wet 'N Wild, Inc.: *See*—
Millay, George D.; and Harper, Ronald D., 266,346, Cl. D21-244.000.
Wilkes, Kenneth R., to Quaker Oats Company, The. Toy tractor. 266,340, 9-28-82, Cl. D21-132.000.
Wilkes, Kenneth R., to Quaker Oats Company, The. Toy race car. 266,342, 9-28-82, Cl. D21-137.000.
Willsie Cap and Gown Company: *See*—
Kampfe, Kenneth E., 266,289, Cl. D2-448.000.
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 28, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

23	4,351,065
85	4,351,066
160	4,351,067
409	4,351,068

CLASS 3

1.5	Re.31,040
1.912	4,351,069
27	4,351,070

CLASS 4

324	4,351,071
503	4,351,072
654	4,351,073

CLASS 6

1	4,351,074

CLASS 7

138	4,351,075

CLASS 8

94.16	4,351,639
149.1	4,351,076
463.	4,351,638
524	4,351,640
638	4,351,641

CLASS 15

1.7	4,351,077
49 C	4,351,078
104.06 A	4,351,079
167 R	4,351,080
210 R	4,351,081
316 R	4,351,082
373	4,351,083

CLASS 16

45	4,351,084
228	4,351,086
273	4,351,085

CLASS 17

44.1	4,351,087
50	4,351,088

CLASS 19

129 R	4,351,089

CLASS 23

230 EP	4,351,643
230 M	4,351,642
293 R	4,351,644

CLASS 24

263 D	4,351,090

CLASS 27

22 R	4,351,091

CLASS 28

100	4,351,092
149	4,351,093

CLASS 29

1.2	4,351,094
25.12	4,351,095
38 A	4,351,096
229	4,351,097
402.15	4,351,098
571	4,351,099
577 C	4,351,100
	4,351,101
596	4,351,102
	4,351,103
603	4,351,104
622	4,351,105
730	4,351,106
736	4,351,107
741	4,351,108
747	4,351,109
749	4,351,110

CLASS 30

164.9	4,351,111
392	4,351,112

CLASS 33

137 R	4,351,113
174 H	4,351,114
178 D	4,351,115
307	4,351,116
435	4,351,117

CLASS 34

24	4,351,118
28	4,351,119

CLASS 36

117	4,351,120
125	4,351,121

CLASS 37

58	4,351,122

CLASS 40

120	4,351,123
158 B	4,351,124
381	4,351,125

CLASS 43

5	4,351,126
9	4,351,127
44.91	4,351,128

CLASS 46

74 D	4,351,129

CLASS 47

58	4,351,130

CLASS 48

61.	4,351,645
197 R	4,351,646
	4,351,647

CLASS 49

501	4,351,131

CLASS 51

180	4,351,132
358	4,351,133

CLASS 52

12	4,351,134
67	4,351,135
155	4,351,136
202	4,351,137
309.4	4,351,138
378	4,351,139
542	4,351,140

CLASS 53

473	4,351,141
575	4,351,142

CLASS 55

137	4,351,648
162	4,351,649
181	4,351,650
210	4,351,651
229	4,351,652
394	4,351,653

CLASS 56

17.5	4,351,143
295	4,351,144
400.16	4,351,145

CLASS 57

6	4,351,146
208	4,351,147
209	4,351,148
263	4,351,149

CLASS 60

226 R	4,351,150
290	4,351,151
395	4,351,152
581	4,351,153
605	4,351,154
618	4,351,155
737	4,351,156

CLASS 62

1	4,351,157
13	4,351,654
28	4,351,655
60	4,351,158
79	4,351,159
201	4,351,160
235.1	4,351,161
239	4,351,162
305	4,351,163
315	4,351,164
371	4,351,165

CLASS 63

15	4,351,166

CLASS 65

1	4,351,656
3.11	4,351,657
3.12	4,351,658
3.13	4,351,659
5	4,351,660
	4,351,661
30.1	4,351,662
66	4,351,663
128	4,351,664

CLASS 70

16	4,351,169
90	4,351,170
339	4,351,171
366	4,351,172
456 R	4,351,173

CLASS 71

103	4,351,665
106	4,351,666
118	4,351,667

CLASS 72

47	4,351,174
203	4,351,175
322	4,351,176
354	4,351,177
383	4,351,178
391	4,351,179
405	4,351,180

CLASS 73

23	4,351,181
27 R	4,351,182
32 R	4,351,183
104	4,351,184
	4,351,185
151	4,351,186
178 R	4,351,187
189	4,351,188
196	4,351,189
638	4,351,190
728	4,351,191
861.18	4,351,192
864.82	4,351,193

CLASS 74

5.37	4,351,194
10.33	4,351,195
15.4	4,351,196
89.22	4,351,197
482	4,351,198
566	4,351,199
568 T	4,351,200
598	4,351,201
604	4,351,202
606 R	4,351,203
804	4,351,204
866	4,351,205
	4,351,206

CLASS 75

2	4,351,668

CLASS 82

36 R	4,351,207

CLASS 83

167	4,351,208
788	4,351,209
835	4,351,210
861	4,351,211

CLASS 84

1.01	4,351,212
	4,351,213
1.03	4,351,214
	4,351,215
1.15	4,351,216
1.16	4,351,217
1.19	4,351,218
1.21	4,351,219
1.24	4,351,220
1.28	4,351,221
423 R	4,351,222

CLASS 89

14 R	4,351,223
37 BA	4,351,224

CLASS 91

50	4,351,225
387	4,351,226

CLASS 92

71	4,351,227
128	4,351,228
	4,351,229

CLASS 98

31	4,351,230

CLASS 99

277.2	4,351,231
540	4,351,232

CLASS 100

48	4,351,233

CLASS 101

10	4,351,234
93.04	4,351,235
128.4	4,351,238
148	4,351,236
216	4,351,237

CLASS 102

364	4,351,239
	4,351,240

CLASS 104

93	4,351,241

CLASS 105

206 A	4,351,242
241.2	4,351,243

CLASS 106

2	4,351,669
88	4,351,670
90	4,351,671

CLASS 108

107	4,351,244
136	4,351,245
156	4,351,246

CLASS 109

19	4,351,247

CLASS 110

170	4,351,248
210	4,351,249
227	4,351,250
261	4,351,251
346	4,351,252

CLASS 111

2	4,351,253

CLASS 112

158 E	4,351,254

CLASS 114

41	4,351,255
85	4,351,256
219	4,351,257
230	4,351,258
	4,351,259
	4,351,260
264	4,351,261
284	4,351,262

CLASS 118

203	4,351,264
211	4,351,265
425	4,351,266
665	4,351,263
718	4,351,267

CLASS 119

3	4,351,268
	4,351,269
5	4,351,270
14.09	4,351,271
20	4,351,272
51 R	4,351,273
53.5	4,351,274

CLASS 122

7 R	4,351,275
20 B	4,351,276
390	4,351,277

CLASS 123

25 A	4,351,289
59 BM	4,351,290
145 A	4,351,291
188 AA	4,351,292
195 R	4,351,278
198 DB	4,351,293
291	4,351,294
300	4,351,295
328	4,351,296
391	4,351,279
415	4,351,280
421	4,351,297
425	4,351,281
	4,351,282
432	4,351,298
458	4,351,283
472	4,351,299
527	4,351,300
545	4,351,284
557	4,351,301
566	4,351,302
568	4,351,285
	4,351,303
585	4,351,304
590	4,351,305
601	4,351,286
609	4,351,287
	4,351,306
618	4,351,307
627	4,351,308
630	4,351,309
644	4,351,310

CLASS 124

41 A	4,351,311

CLASS 125

15	B1 4,219,004

CLASS 126

30	4,351,312
39 J	4,351,313
59	4,351,314
73	4,351,315
93	4,351,316
139	4,351,317
197	4,351,288
208	4,351,318
425	4,351,319
	4,351,320
446	4,351,321

CLASS 127

46.3	4,351,672

CLASS 128

1 R	4,351,322
4	4,351,323
80 J	4,351,324
96	4,351,325
130	4,351,326
200.14	4,351,327
202.16	4,351,328
204.21	4,351,329
207.15	4,351,330
207.17	4,351,331
214 F	4,351,332
214.4	4,351,333
218 A	4,351,335
218 PA	4,351,334
232	4,351,336
260	4,351,337
285	4,351,338
	4,351,339
288	4,351,340
348	4,351,341
349 B	4,351,342
695	4,351,343
720	4,351,344
786	4,351,345

CLASS 131

276	4,351,346
	4,351,347

CLASS 134

3	4,351,673

CLASS 135

66	4,351,348

CLASS 137

15	4,351,349
39	4,351,350
68 R	4,351,351
	4,351,352
219	4,351,353
240	4,351,354
329.06	4,351,355
446	4,351,357
491	4,351,356
512.1	4,351,358
521	4,351,359
624.12	4,351,360
625.44	4,351,361
625.65	4,351,362

CLASS 138

30	4,351,363
133	4,351,364
149	4,351,365
	4,351,366

CLASS 139

11	4,351,367
324	4,351,368
435	4,351,369
450	4,351,370

CLASS 140

92.3	4,351,371

CLASS 141

2	4,351,372
51	4,351,373
71	4,351,374
98	4,351,375

CLASS 144

193 A	4,351,377
	4,351,378
193 G	4,351,376
365	4,351,379

CLASS 148

1.5	4,351,674
6.15 R	4,351,675
6.31	4,351,678
9 C	4,351,676
188	4,351,677

CLASS 152

169	4,351,380
209 R	4,351,381
330 RF	4,351,382

CLASS 156

70	4,351,679
79	4,351,680
99	4,351,681
143	4,351,682
167	4,351,683
215	4,351,684
234	4,351,685
329	4,351,686
353	4,351,687
358	4,351,688
378	4,351,689
384	4,351,690
435	4,351,691
443	4,351,692
556	4,351,693
574	4,351,694
603	4,351,695
643	4,351,696
	4,351,697
661.1	4,351,698

CLASS 162

112	4,351,699
252	4,351,700

CLASS 164

448	4,351,383
468	4,351,384

CLASS 165

61	4,351,385
89	4,351,386
95	4,351,387
104.26	4,351,388
141	4,351,389
149	4,351,390
154	4,351,391
186	4,351,392

CLASS 169

37	4,351,393
61	4,351,394

CLASS 172

13 4,351,395
40 4,351,396
464 4,351,397

CLASS 173

104 4,351,398
148 4,351,399

CLASS 175

69 4,351,400
329 4,351,401
340 4,351,402

CLASS 177

2 4,351,403

CLASS 178

22.11 4,351,982

CLASS 179

1 SC 4,351,983
7.1 R 4,351,984
18 GF 4,351,985
27 FH 4,351,986
99 H 4,351,987

CLASS 180

14 R 4,351,404
65 A 4,351,405
65 R 4,351,406
75 4,351,407
135 4,351,408
165 4,351,409
210 4,351,410

CLASS 181

168 4,351,411
170 4,351,412

CLASS 182

139 4,351,413

CLASS 184

105 B 4,351,414

CLASS 187

29 B 4,351,415
29 R 4,351,416
81 4,351,417

CLASS 188

24.22 4,351,418
71.9 4,351,419
73.45 4,351,420
4,351,421
170 4,351,422
216 4,351,423

CLASS 192

18 R 4,351,424
58 B 4,351,425
4,351,426
98 4,351,427
851 * B1 3,160,264

CLASS 198

302 4,351,428
688 4,351,429
690 4,351,430
823 4,351,431
847 4,351,432

CLASS 200

5 A 4,351,988
48 CB 4,351,989
50 AA 4,351,990
61.27 4,351,991
144 B 4,351,992
148 A 4,351,993
153 SC 4,351,994
159 A 4,351,995

CLASS 201

1 4,351,701
5 4,351,702

CLASS 204

1 T 4,351,703
15 4,351,704
108 4,351,705
129.3 4,351,706
158 R 4,351,707
159.12 4,351,884
159.23 4,351,708
180 G 4,351,711
180 P 4,351,710
180 R 4,351,709
192 EC 4,351,712
207 4,351,713
298 4,351,714
301 4,351,715

CLASS 206

264 4,351,433
366 4,351,434
379 4,351,435
477 4,351,436

CLASS 208

8 LE 4,351,716
216 PP 4,351,717
262 4,351,718

CLASS 209

234 4,351,719
545 4,351,437
675 4,351,438

CLASS 210

101 4,351,720
150 4,351,721
195.3 4,351,722
198.1 4,351,723
230 4,351,724
4,351,725
401 4,351,726
411 4,351,727
415 4,351,728
603 4,351,729
629 4,351,730
647 4,351,731
689 4,351,732
738 4,351,733
748 4,351,734

CLASS 211

49 D 4,351,439
57.1 4,351,440
207 4,351,441

CLASS 215

216 4,351,442
4,351,443

CLASS 219

10.49 R 4,351,996
10.55 B 4,351,999
10.55 E 4,351,997
10.55 R 4,351,998
10.77 4,352,000
64 4,352,001
78.15 4,352,002
103 4,352,003
121 ED 4,352,004
121 LG Re.31,042
121 LJ 4,352,005
219 4,352,006
301 4,352,007
540 4,352,008

CLASS 220

20 4,351,444
91 4,351,445
210 4,351,446
306 4,351,447
318 4,351,448
4,351,449
319 4,351,450
420 4,351,451

CLASS 221

11 4,351,452

CLASS 222

83.5 4,351,453
143 4,351,454
153 4,351,455
400.7 4,351,456

CLASS 223

57 4,351,457
106 4,351,458

CLASS 225

96.5 4,351,459

CLASS 226

25 4,351,460
28 4,351,461
150 4,351,462
154 4,351,463

CLASS 227

7 4,351,464
4,351,465
8 4,351,466
142 4,351,467

CLASS 228

4.5 4,351,468
135 4,351,469
157 4,351,470

CLASS 229

15 4,351,471
43 4,351,472
4,351,473
68 R 4,351,474

CLASS 235

92 EV 4,352,010
92 ST 4,352,009
375 4,352,011
487 4,352,012

CLASS 237

46 4,351,475
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	4,351,405		4,352,135		4,351,123		4,351,534		4,351,857		4,351,406
	4,351,446		4,352,149		4,351,251		4,351,549	23 :	4,351,224		4,351,409
	4,351,477		4,352,152		4,351,342		4,351,636		4,351,467		4,351,419
	4,351,499		4,352,168		4,351,389		4,351,637	24 :	4,351,071		4,351,425
	4,351,506		4,352,179		4,351,478		4,351,767		4,351,143		4,351,426
	4,351,529		4,352,185		4,351,554		4,351,863		4,351,223		4,351,450
	4,351,536		4,352,188		4,351,611		4,351,886		4,351,552		4,351,500
	4,351,540		4,352,202		4,351,630		4,351,984		4,351,671		4,351,544
	4,351,546		4,352,207		4,351,722		4,351,986		4,351,732		4,351,550
	4,351,579	08 :	4,351,084		4,351,912		4,351,994		4,351,810		4,351,626
	4,351,589		4,351,155		4,351,938		4,352,012		4,352,045		4,351,719
	4,351,592		4,351,161		4,351,982		4,352,055		4,352,071		4,351,753
	4,351,665		4,351,181		4,352,153		4,352,101		4,352,074		4,351,769
	4,351,670		4,351,413		4,352,193		4,352,144		4,352,160		4,351,771
	4,351,681		4,351,808	13 :	4,351,073		4,352,151	25 :	4,351,091		4,351,909
	4,351,682		4,351,822		4,351,244		4,352,208		4,351,092		4,351,928
	4,351,693	09 :	4,351,085		4,351,246		4,352,209		4,351,101		4,351,929
	4,351,696		4,351,096		4,351,273	18 :	4,351,103		4,351,275		4,351,933

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